

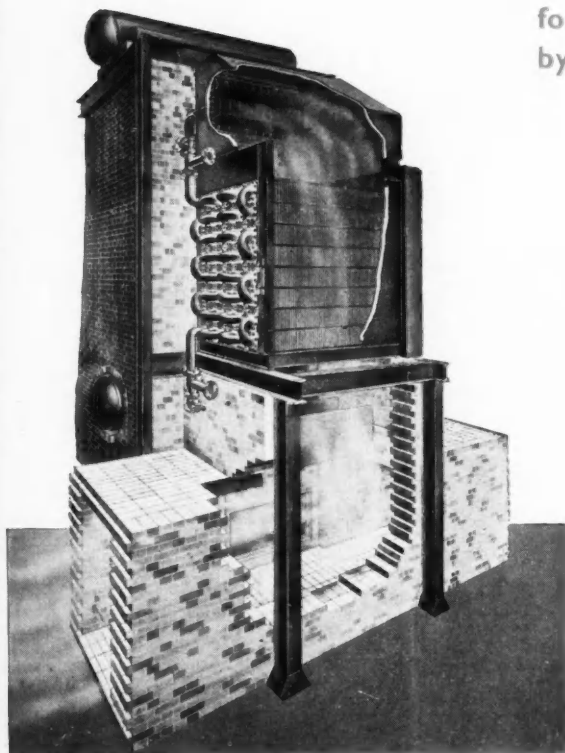
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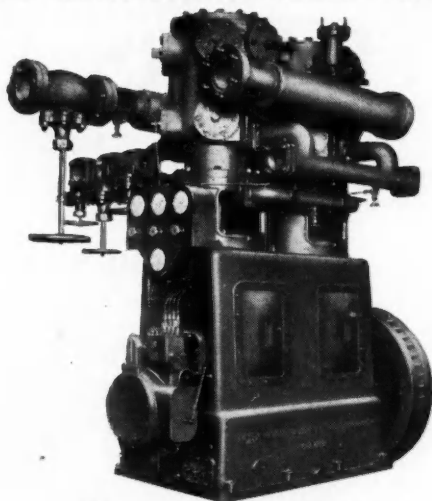
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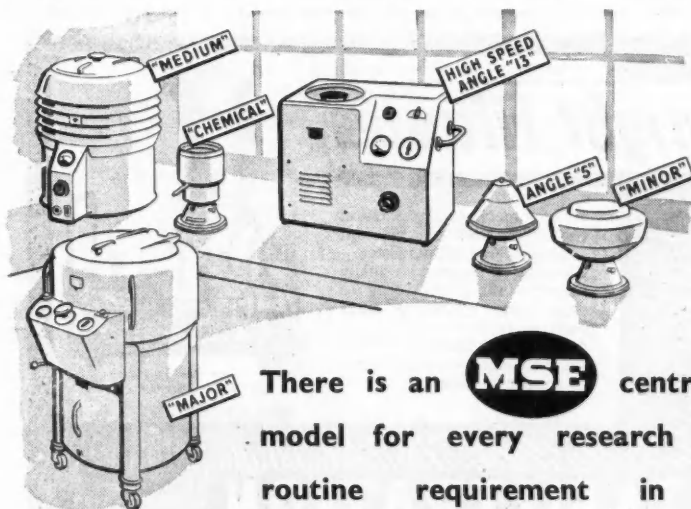


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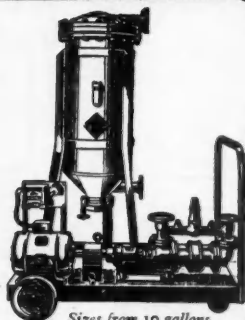
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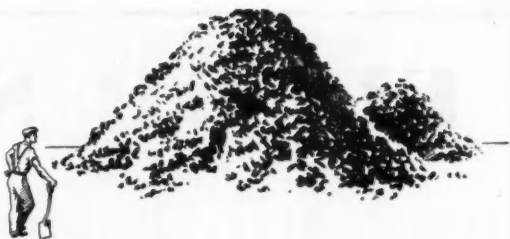
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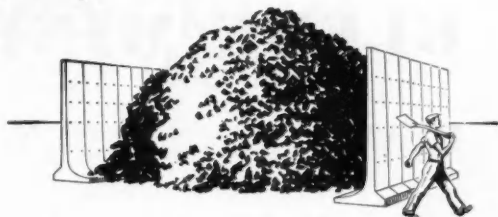
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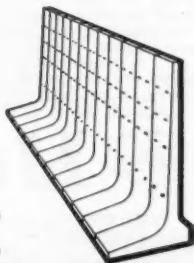
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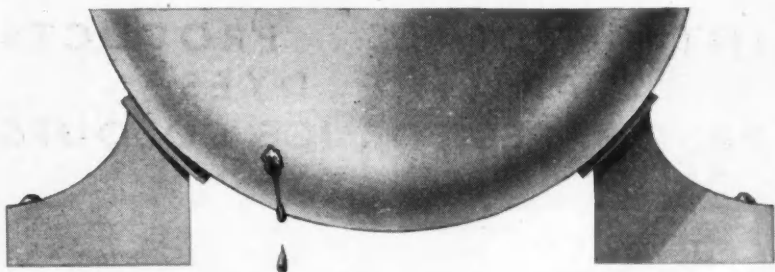
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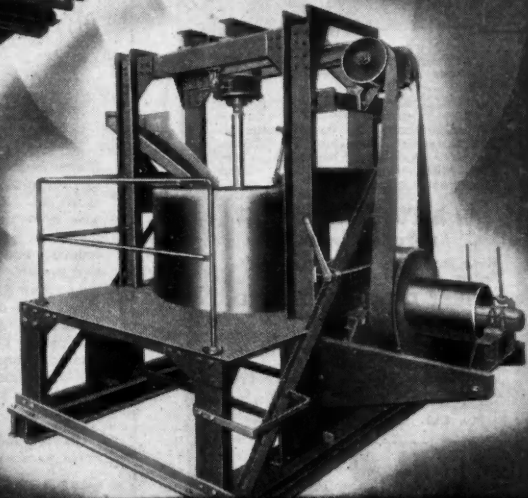
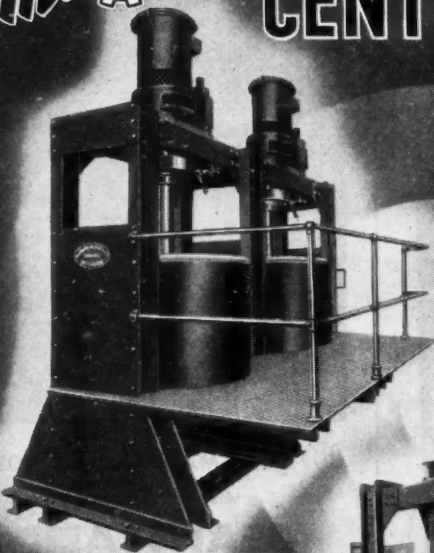
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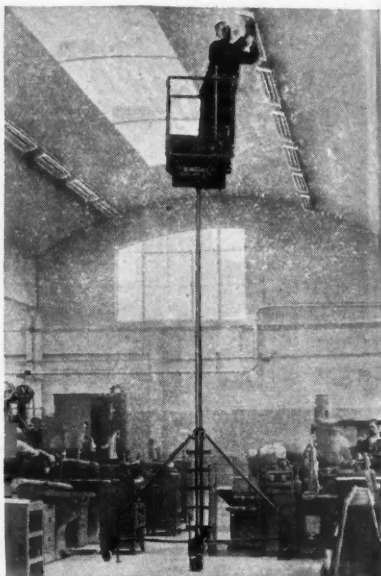
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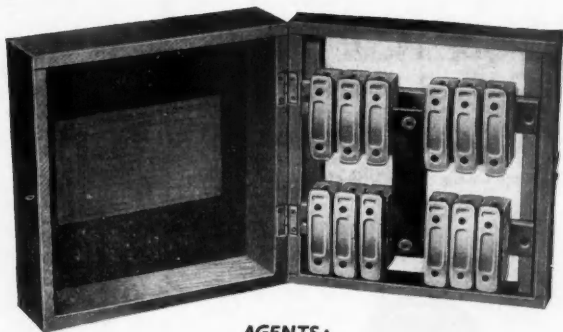
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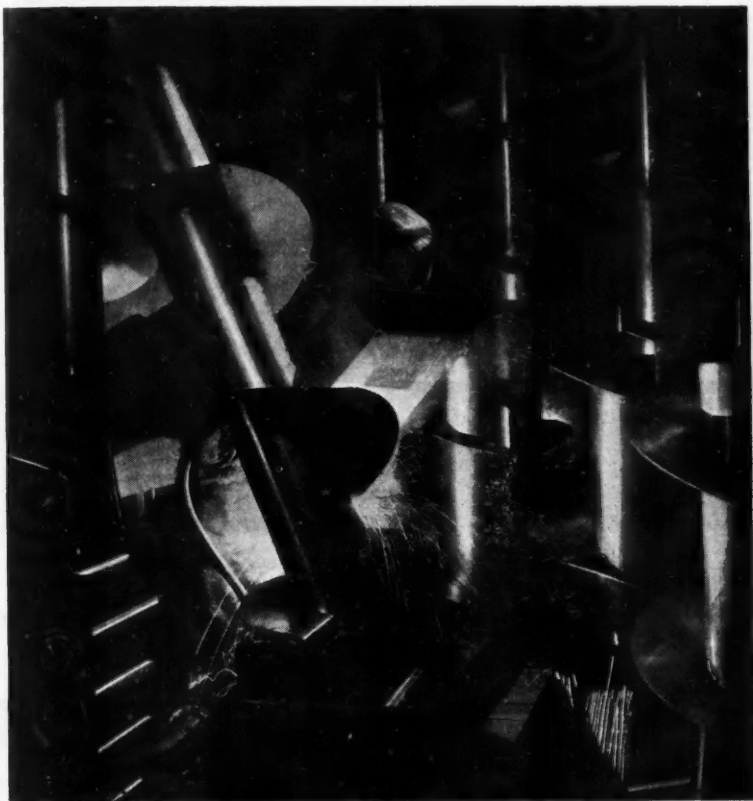
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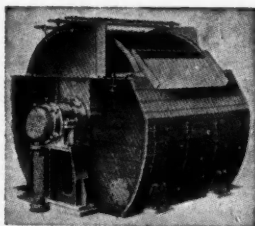


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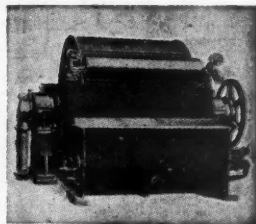
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Volume LXV

13 October 1951

Number 1683

'Gobbledygook' or 'Barnacular'

RATHER more than a year ago (CHEMICAL AGE, 62, 525) we referred somewhat sadly to the 'inability of most British scientists to write even a proper scientific paper, let alone a popular article'. These words were not ours—the indictment had been made by the editor of a scientific quarterly. A return to this subject is stimulated by the publication by HMSO of Sir Ernest Gowers' 'A B C of Plain Words' (1951, 3s. 0d., 146 pp.), a sequel to his best-seller, 'Plain Words', also cheaply published by the Stationery Office. Each of these books will be of enormous help to the word-conscious scientist. It is, indeed, the duty of the scientist to let books of this kind help him for his function in society cannot be effectively carried out if he is unable to make himself readily understood by plain people as well as by complex colleagues.

It is never enough that scientists should understand other scientists. The application of new scientific possibilities, or even their pilot-scale development, often depends upon the verdict of non-scientists. Many a young scientist has suffered deeply from frustration because

his 'pet' project seems to have been 'talked out'; deep-seated embitterment develops later when someone else produces much the same idea and receives much more encouragement. The wastage in such a situation is enormous. First, the application of a sound idea has probably been delayed by years. Second, the frustrated scientist is likely to become a much poorer scientist. Yet the difference between success and failure is often no more than the ability to use words clearly and plainly. This matters far more in applied science than in pure science. The realm of pure science is exclusively populated by scientists—their vocabulary is widened by specialised words and phrases and interpreters are not needed. For applied science the verbal approach must be very different.

Sir Ernest Gowers in his latest book has borrowed the American word 'gobbledygook' to describe that prevalent twentieth century style known to many people as 'officialese'. Sir Ernest, with no little justice, has rejected this latter and better-known word because it implies that the style is perpetrated mainly by administrators in public service. However true it may be that civil

servants are prolific offenders, this overwordy, over-pompous style is not a monopoly of Whitehall or Washington. Private enterprise has its own bureaucracies as well, and their literary output is often stamped with the same die. Scientific writing abounds with it, and more dangerously because some of the pompous phrases have now become common coinage in papers written by scientists for other scientists.

Sir Ernest is unlikely to establish 'gobbledygook' as the proper name for this style. Ivor Brown's suggested word 'barnacular' seems much more appropriate. But named or nameless, this overweighted, top-heavy style, often as difficult to recognise as it is to define, is undeniably a pestilence of the twentieth century mind. The whole of Sir Ernest Gowers' book is aimed at destroying this style; *destroying* it, let it be noted, not *liquidating* it! He has selected many of the words and phrases that the 'gobbledygook' or 'barnacular' producers delight in using. He has analysed their use and shown in almost every example that shorter words or simpler phrases are preferable not merely for economy but also for greater clarity and precision.

Younger scientists, above all, should read this book. They should place it on their private shelf alongside Professor Kamm's 'Presentation of Technical Information' (Constable, 1948). The greatest harm done by 'gobbledygook' is the harm it does to the young who, when they have something to say, suppress a

natural tendency to use simple and straightforward words because a 'gobbledygook' presentation sounds weightier, more adult, more impressive. To quote an extreme example from 'A B C of Plain Words', is it worth being more impressive by saying 'there is a complete lack of ablution facilities' instead of 'there is nowhere to wash'? Or, a milder example, is it worth writing 'in the initial stages' when 'at first' will usually convey exactly the same meaning. Most 'gobbledygook' words or phrases are relatively harmless in isolated use, but a sentence or paragraph that contains a series of them presents the reader with extra interpretative work. It is increasingly difficult to present scientific ideas and developments in non-technical or semi-technical language. It is no service to science or the reader to add the complexities of 'gobbledygook' as well.

Many pleas have been made that science students should receive a wider education in 'English' during their college or university trainings. Desirable though this is, the time that is available is obviously limited. If every prescription for educating our future scientists was followed to the full, they would complete their scientific and military training hardly in time to establish pension rights. The ability to express oneself clearly and plainly in one's own language is a duty of self-education. It is a form of study or training that begins at any age and need never end. Sir Ernest Gowers' two books are excellent primers.

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Notes & Comments

Commonwealth Raw Materials

ONE lesson learnt from the conference of Commonwealth Ministers recently concluded in London was the urgent need to expand production of raw materials. So much emphasis has lately been laid on greater output of goods that the need to increase what must be the basis of all productivity—the raw materials themselves—has been neglected. As a result of the discussions Canada is to produce more iron ore and non-ferrous metals; Australia is to increase her output of copper, lead, zinc, steel and aluminium; South Africa is to add to her output of phosphate, oil-refining and insecticides, while more iron, pig-iron, and steel is to come from India, more sulphur and manganese from Pakistan, and greater quantities of rubber and fertilisers from Ceylon. To do this, however, it was recognised would require, in many cases, additional capital equipment, new power stations, fresh roads, extension of railways, and so on. Can Britain, already burdened with a heavy re-armament programme supply these without undue delay and at an economical cost? The producing countries, reasonably enough, also want to be assured that if more raw materials are supplied, they will still be able to find sufficient buyers in the years ahead, when shortages are less acute. Britain, as the largest consumer, was probably most concerned over stable prices, and although as the Lord Privy Seal, Mr. R. R. Stokes, stressed, the conference was not concerned with price fixing, nevertheless it was generally accepted that to avoid inflation reasonable stability was required. Although not much in the nature of practical decisions has been revealed, frank discussion between Ministers representing at least ten Commonwealth countries must have been beneficial.

The American Way

THE device adopted here to curtail rearmament profits is divided limitation. Should there be a change of Government we are likely to see a revival of E.P. taxation. The less straightened

American economy has not required such general prescriptions—so far. On the other hand, America has introduced special legislation to deal with the tax liabilities of companies engaged in defence production. A special device allows the rapid write-off (by high rates of annual tax relief) of plant urgently needed for defence production but which would have much smaller use when defence needs decline or have been satisfied. This device was introduced to encourage firms to spend their own capital upon such plant instead of asking the Government for funds or loans. The first necessity to qualify for the increased rate of tax relief is a 'certificate of necessity' from DPA (Defence Production Administration). Next, it must be proved that the plant to be installed has genuine obsolescence should defence orders dwindle.

Anybody's Guess

CHEMICAL projects in the U.S. seem to be finding it much easier to get certificates of necessity than to get their claims of plant obsolescence accepted. The versatility of uses to which chemical plant can be put is probably the principal explanation; similarly, chemicals available in large-scale amounts are apt to find new uses when some major use declines. At the same time, however, manufacturers are beginning to wonder whether high rates of tax relief that are exhausted in a few years are sound financial policy. They are—if the rate of taxation stays at or near the current level. If taxation rises sharply, it may be more beneficial to a company to have smaller proportions of tax relief per year but which cover a longer period. In short, a twenty-year tax write-off will eventually save more tax payments than a five-year write-off. The chemical industry's particular difficulties in getting obsolescence recognition may turn out to be an advantage in the long run. The moral is perhaps more general in application. Whenever or however state legislation tries to control the normal trends of economic sequence, the old virtues of foresight are lessened in value and decisions become anybody's guess.

Fundamental Research

GREAT BRITAIN is not alone in her anxieties about the possible reductions in financial aid for scientific training (THE CHEMICAL AGE, 65, 451). In the U.S.A., the powerful and influential voice of the American Chemical Society, the largest professional group of scientists and technologists in the world, has been raised to demand that Congress should appropriate for the National Science Foundation the full \$14,000,000 requested for the foundation's budget for the next fiscal year. The resolution was made public by the chairman of the board of the ACS, Dr. Charles Allen Thomas, whose views on the importance of fundamental research were expressed to the English Press during his visit to London last month. Chief reason advanced by the House for not granting the full amount was that no real contribution to the advancement of fundamental knowledge could be made during the period of uncertainty caused by strained foreign relations between the U.S.A. and U.S.S.R. The fallacy of such an argument is shown by a summary of the position given in the editorial of the *Chemical and Engineering News* (29, 3789). As the board of the ACS points out, no one can foretell how long the present international emergency may last, and if it continues for long, failure to support fundamental research might well lead to a situation in which America was at the mercy of a country where such research had been maintained on a large scale. Similar views were expressed by the National Science Federation and Dr. Reyerson, head of the chemistry department at the University of Minnesota. Warnings from such sound authorities as these might well be heeded by Congress and the British Treasury.

A Vicious Professor

ANOTHER example of the Lysenko touch has recently made its appearance in Russian science, according to a *Pravda* article translated in the American *Digest of the Soviet Press*. This time Professor Linus Pauling, chairman of the department of chemistry and chemical engineering at the California Institute of Technology, has come under

the lash of Soviet scientific criticism. His famous theory of resonance, which accounts for so much that is otherwise inexplicable in organic chemistry, was repudiated, according to the *Pravda* article, by a recent conference of 400 Russian scientific workers, as being pseudo-scientific (how tired the Russian public must be of the word 'pseudo'), vicious, and an example of world outlooks hostile to the Marxist view. How on earth an electron in its orbit can be a world outlook hostile to anything is not explained, but if an electron cannot speak, its detractors evidently can, as the conference roundly condemned four Russian scientists who supported the resonance theory as 'propagandists for the known-to-be erroneous and vicious theory of the American chemist Pauling.' The vicious American chemist Pauling was no doubt supposed to tear his imperialist and pseudo-scientific hair on reading this, but what in fact he did do was remark that 'anyone trying to practice chemistry or teach it without using the resonance theory can expect to be greatly handicapped.' The Russian chemists who were censured he assessed as being among the ablest in Russia.

The Russian Version

THE Russians' retort to Pauling, one Butlerov, who lived in the latter part of the nineteenth century and would probably have been sent to Siberia had the present Russian system been in force, is accredited in one Russian journal with having precipitated the greatest event in the history of organic chemistry when he originated his theory of chemical structure. History thinks otherwise. In his 1906 work 'History of Chemistry', Ernst von Mayer noted that Kekulé and Couper in 1858 laid the beginnings of the so-called structure theory. In a footnote, he wrote that the term 'structure' was first introduced by Butlerov, 'who quite unintentionally awakened the erroneous idea that the actual spatial arrangement of the atoms, could be arrived at by the aid of the above hypothesis.' If, as seems probable, the Russians continue to credit Karl Marx with a scientific authority that he never possessed, it seems fairly certain that, as the Professor remarks, they will eventually suffer, both academically and technologically.

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Research on Contact Insecticides

by DR. F. NEURATH

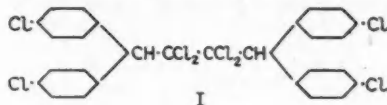
FROM a chemical point of view the examination of insecticides belonging to one class of compounds has proved very useful for the development of modern insecticides. An example of this has been the halogenated compounds of the DDT and BHC group (and later on the Diene and Terpene group) for which Randolph Riemschneider, of Berlin University, used the definition of 'Contact Insecticides with a base of halogenated hydrocarbons' as early as 1945. Consideration of this class as a whole is still the most suitable way of looking at them because the toxic mechanism of the contact insecticides of the DDT, BHC, Diene and Terpene groups is not fully known yet. As neither their ingestion nor inhalation is essential for toxicity the term 'contact insecticides' seems well chosen. Riemschneider¹ maintains that the ideal insecticide is one which is poisonous by external contact in this way.

Riemschneider^{2,3} investigated from 1945 to 1948 the interesting question of separating the gas and contact poisoning effects. Several types of apparatus were developed for this purpose and the latest one directed a current of air of ca. 100 litres per hour towards the test animals (*Calliphora*) from above and then sucked it off from underneath. The animals could be forced by means of shifting stamps to remain in continuous contact with impregnated filters. By determining the poisonous effect of γ -benzene hexachloride (γ -BHC) on *Calliphora* in a 100 litres air current and in a normal 'Petrischalen-Filter test'¹⁰ it was found that the speed of activity of γ -BHC in the air current compared with the normal test was hardly reduced. That is to say the high knockdown ability of γ -BHC was not entirely dependent on its gas effect.^{3,4a}

Ten Years' Work

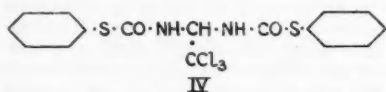
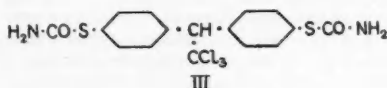
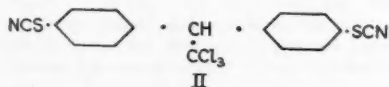
Riemschneider and his collaborators Cohen, Becker, Rausch, Schmidt, Kühnl, Böttcher, Wojahn and others^{2b,4b} have synthesised in the last ten years more than 300 halogenated compounds and examined their contact effect. Research on constitution and effect of these compounds was done with the restriction that only constitutionally

related compounds with similar physical properties were compared with each other. Direct and general relations between poisonous action and structure are not to be expected from insecticides, since their action is due to many factors.⁵ Riemschneider found that the halogenated hydrocarbons with a molecular weight higher than 450, a high melting point (above 200°C.) and small lipoid-solubility (i.e., little or no solubility in acetone) will show no strong insecticidal activity. The molecular limitation for highly active contact insecticides with residual effect 270-450 was suggested by him in 1946 after examination of 160 halogenated hydrocarbons of the various groups^{2b,6}. Two years later, Lord⁷ confirmed these statements for the DDT group. The lower limit for molecular weight is governed by the residual effect which is so important in practice. Starting from these considerations concerning the non-insecticidal halogenated hydrocarbons, several researches on highly active compounds of the DDT group and of related materials were revised (Riemschneider^{9,11}). One author⁸ classified as effective as *p,p'*-DDT, the compound 1,1,4,4-tetra[*p*-chloro-phenyl]-2,2,3,3-tetrachlorobutane (I) which possesses a melting point



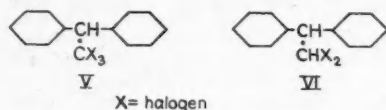
of 270°. Riemschneider⁹, however, found I to be entirely ineffectual, as was to be expected on account of its molecular weight of 638, its high melting point and small lipoid-solubility. Consequently, Bernimolin's⁸ supposition that the formation of I (under irradiation of *p,p'*-DDT with U.V. light) were responsible for the extraordinary residual effect of DDT preparations, was discredited. While Wagner-Jauregg and collaborators¹⁰ decided that the product obtained by condensation from chloral and phenylthiocyanic ester with concentrated sulphuric acid was just as effective against insects as *p,p'*-DDT the investigation of Riemschneider and Wojahn¹¹ proved it ineffective. It has not, as former

investigators accepted^{10,12} the structural formula as shown in Figs. II or III, but that shown in Fig. IV.¹¹ Wagner-Jauregg¹⁰



found a high insecticidal effect for this condensation product because he wrongly supposed the structure was III and because he destroyed the sensitive compound (IV) in his test experiments by heating in alcohol.

The examination of 110 derivatives of the DDT, DDD group and related compounds (among them 5 DDT and 3 DFDT isomers) led Riemschneider to the establishment of the definitions of the 'contactophores' and 'auxocontacts'^{19,4c}. Contactophores can be regarded as:



On the insertion of one or two substituents in certain positions of V or VI, above all the *para*-positions (Table I), the effect can be influenced in a positive or negative

Table I.—Efficacy of the isomers of DDT and DFDT upon *Musca* (according to Riemschneider^{4a})

Insecticide	50% Mortality*
<i>p,p'</i> -DDT	16—20 γ
<i>m,p'</i> -DDT	16—24 γ
<i>o,p'</i> -DDT	800—1200 γ
<i>o,m'</i> -DDT*	>1200 γ
<i>o,o'</i> -DDT	>1600 γ
<i>p,p'</i> -DFDT	12—24 γ
<i>m,p'</i> -DFDT	20—32 γ
<i>o,p'</i> -DFDT	800—1000 γ

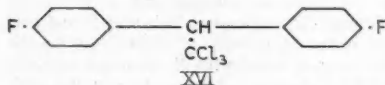
* Bell test (sparkling test), Mitt. physiol. chem. Inst. R12, Dec. 1947.—*Angew. Chem.* A61, 333 (1949).

way. Positive auxocontacts are, for instance: Cl, F, CH₃, C₂H₅, CH₃O; negative auxocontacts: COOH, C₆H₅, C₆H₁₁, NO₂, NH₂, OH and others. In *p,p'*-DFDT the *para*-F atoms are the auxocontact structural elements of contactophore V. With the insertion of a greater number than two auxocontacts into the named contactophores, the conditions become more complicated. The only ones effective among the DDT compounds with four positive auxocontacts are the 3,3',4,4'-substituted compounds, viz: the condensation products from chloral and *o*-xylene, *o*-chloro-toluene, or *o*-fluoro-toluene and similar aromatic components^{4c,20}. To prove that the COOH group is a negative auxocontact, Riemschneider¹⁹ synthesised 30 carboxyl compounds of the DDT-series; some of which are presented in Table 2 and characterised by their melting point.

Warburg Method

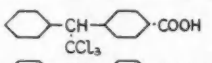
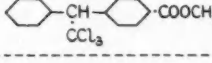
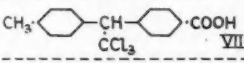
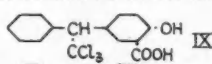
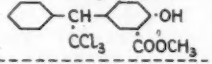
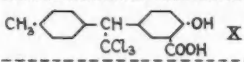
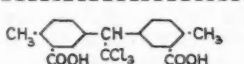
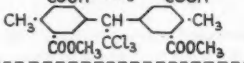
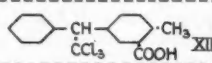
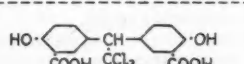
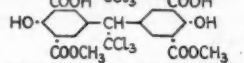
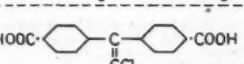
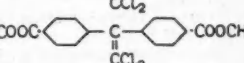
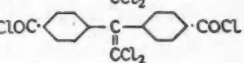
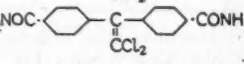
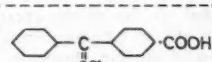
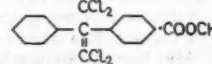
Against *Drosophila melanogaster* all named acids and derivatives showed no contact insecticide action¹⁰ in the 'Petrischalen-Filtertest'^{19,15}. To determine whether the antipodes of DDT-like substances possessed different toxic effects to their racemates, Riemschneider tested the racemates of VII, IX, X and XII (Table 2), using the brucine and strychnine salts of the antipodes, with yeasts and bacteria as test objects according to the Warburg method. The toxic differences between antipodes and racemates were only small but were observable.

Riemschneider^{4c,21} also investigated the fluorine analogues of the DDT compounds. The optimal conditions for the production of DFDT (XVI) in the laboratory were



ascertained. Fluorobenzene condenses quicker with chloral than chlorobenzene. *p,p'*-DFDT possesses a greater rate of insecticidal activity than *p,p'*-DDT, which is important for many purposes. With periodical *p,p'*-DFDT poisoning of *Drosophila melanogaster* in the 'Petrischalen-Filtertest' Riemschneider and Robsmann²² within two years could breed in the laboratory *p,p'*-DFDT-resistant animals (Table 3). The 46th generation of DFDT-resistant

Table 2.—Carboxyl compounds of the DDT series and derivatives (according to Riemschneider ¹⁶)

FORMULA	MELTING POINT °C.
	141
	89
	160
	186-187
	116-117
	243
	239-240
	163-5
	162-163-5
	291-292
	201-202
	276-277
	188-189
	100
	250
	203
	64-5-65

animals showed practically no resistance against *p,p'*-DDT, γ -BHC, M410¹⁸ and others.

Table 3.—Percentage mortality of some generations of *Drosophila melanogaster* on application of 15 mg. *p,p'*-DDT per dish^{12a}

Generation	Percentage mortality after 2½ hours effect DFDT		Percentage mortality after 2 hours effect DFDT	
	Normal Per cent	resistant Per cent	Normal Per cent	resistant Per cent
1	100	—	75	—
11	100	80	80	55
16	100	70	70	50
20	100	62	70	35
32	100	50	70	30

* Petrischalen Filtertest.—Age of the test-animals: 4 days^{13, 14}.

The question of configuration and toxic effect in the BHC group was also examined experimentally and Riemschneider referred to it in a lecture in January, 1948, which is herewith partly quoted.¹⁵ 'As in the DDT and the BHC group all the especially high-melting compounds are ineffective. Investigations of the constitution and the effect of contact insecticides of the halogenated hydrocarbon class have proved that, in any case, the position of the atoms or atom-groups in space is of extraordinary influence on the efficacy of the compounds. This appears very distinctly in the five stereoisomeric benzene hexachlorides, which differ considerably in their toxicity to insects. The high-melting β -compound is in all examined cases practically non-poisonous, the ϵ -isomer nearly always ineffectual, while α and δ mostly show a limited efficiency. The outstanding insecticidal effect of γ -BHC is proved by experiments of English, French, Spanish, American and German authors'.

It is of interest that the pentachlorocyclohexenes which are obtained by splitting off one molecule of HCl from the corresponding hexachlorocyclohexane (eq. 1) by Riemschneider, Schosten and Böttger¹⁶ show no insecticidal effect (Table 4). This was to be expected on account of experiences concerning the efficiency of compounds which are yielded by alkali treatment of highly effective halogenated hydrocarbons; it is, for instance, known that β,β,β -trichloro- α,α -bis-[4-methoxy-phenyl]-ethane [Methoxychlor] by splitting off one molecule HCl changes to the β,β -dichloro- α,α -bis-[4-methoxy-phenyl]-ethylene (eq. 2), which is little or not at all insecticidal. Furthermore, with the formation of trichlorobenzenes from hexachloro-

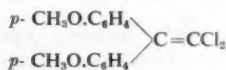
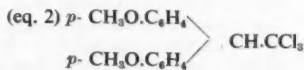
Table 4.—Effect of some BHC compounds and analogues upon the insect *Drosophila melanogaster* in the 'Petrischalen-Filtertest'¹
(according to Riemschneider¹⁸ 48 14)

No.	Halogenated hydrocarbon	mg Insecticide per dish	Effect Per cent non-capacity of move in minutes		
			50 per cent	100 per cent	per cent
1	α -benzenehexachloride	0.7 mg.	270 min.	—	—
2	β -benzenehexachloride	5.0	>300	—	—
3	γ -benzenehexachloride (XIV)	0.0025	90	300	—
4	pentachlorocyclohexene (from XIV)	2.0	>300	—	—
5	δ -benzenehexachloride (XV)	1.25	70	300	—
6	pentachlorocyclohexene (from XV)	2.0	>300	—	—
7	α -benzenehexachloride	5.0	>300	—	—
8	α -1,1,2,4,4,5-hexachloro-cyclohexane (XVI)*	0.7	270	—	—
9	pentachlorocyclohexene (from XVII)	2.0	>300	—	—
10	α -benzenehexabromide	5.0	>300	—	—
11	β -benzenehexabromide	5.0	>300	—	—
12	α -chloro-hexachlorocyclohexane	5.0	>300	—	—
13	α -dichloro-hexachlorocyclohexane (from <i>p</i> -dichlorobenzene)	5.0	>300	—	—
14	trichloro-methyl-hexachlorocyclohexane (from benzotrifluoride)	5.0	>300	—	—
15	hexachloro-hexachlorocyclohexane	5.0	>300	—	—
16	fluoro-hexachlorocyclohexane	0.05	55	175	100
17	fluoro-chloro-hexachlorocyclohexane	0.1	50	100	—
18	bromo-chloro-hexachlorocyclohexane	5.0	>300	—	—
19	chloro-hexabromocyclohexane	5.0	>300	—	—
20	bromo-hexabromocyclohexane	5.0	>300	—	—
21	tetrachloro-methyl-isopropyl-cyclohexanes	0.01	150	300	—
22	pentachloro-methyl-isopropyl-cyclohexanes	0.02	120	280	—
In comparison :					
23	<i>p,p'</i> -DDT	0.01	200	300	—
24	<i>p,p'</i> -DDE	0.004	50	210	—
25	<i>p,p'</i> -DDT	0.025	240	300	—
26	M410 ¹⁴	0.005	190	270	—

* See *The Chemical Age*, 1951, 358; *Z. Naturforsch.*, 5b, 246, 307; 6b, 48, 355 (1951).

cyclohexane or of 1,2,4-trichlorobenzene from α -1,1,2,4,4,5-hexachloro-cyclohexane

(eq. 3) is connected a disappearance of contact insecticidal effect of these compounds.¹²



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MR. F. E. STERNE, managing director of the Atlas Powder Co., Canada, Ltd. has been appointed to the newly created post of production officer, Chemicals and Explosives Division, Canadian Arsenals, Ltd., a Government subsidiary corporation with headquarters at Ottawa. The appointment is for one year. MR. JOHN L. SHARPE has been appointed assistant sales manager at Atlas.

New Graphic Panels & Control Desks

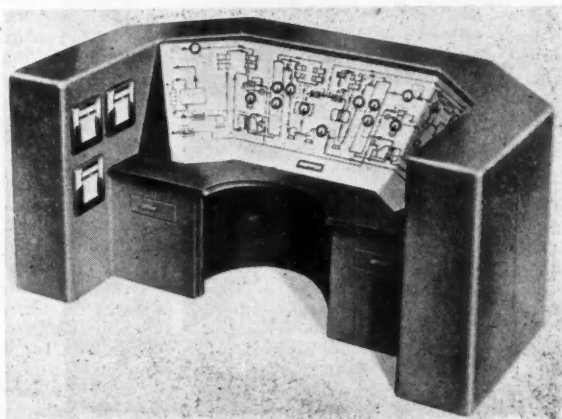
By LEO WALTER, A.M.I.Mech.E., M.S.I.T., M.I.S.A., Consulting Engineer

THE urgent demand for more practical centralised 'push-button' control than achieved so far, by installing individual automatic control instruments in a processing plant, or by assembling standard instruments on larger panels, has led to an interesting new development in instrumentation. Whether the new graphic control panels for centralised plant supervision and control will become standard in future for processing, or whether they will be confined only to large instrumentation of oil or chemical plants cannot be foreseen at the moment. More practical experience is required, and further development of remote transmitting and receiving instruments. Some plant engineers are very enthusiastic at the possibility of supervising and controlling function of a processing plant from their office desk. Others—and among them instrument specialists—declare that some advantages claimed by the makers are exaggerated, and that they prefer the well-established methods of conventional instrument panels and individual controllers of standard size. Nevertheless, the design and purpose of the new graphic panels seems too important to be ignored by progressive plant management, and the following survey gives

an outline of purpose, design, function and application.

The idea behind design of supervisory or controlling graphic panels has originally been to replace the row of black standard boxes housing the measuring and controlling instruments by more conveniently placed smaller controllers, mounted in a flow sheet. Fig. 1 illustrates such a graphic panel with small-size indicator-controllers inserted at the respective points of measurement and control. The second target has been to overcome instrument and transmission time lags from the detecting element to the control mechanism, and back to the regulating unit. Thirdly, centralised indication and readjustments obviate the necessity for the supervising engineer or a plant foreman to move to and fro from plant to panel, and vice versa. The difference between the old and the new control system is shown diagrammatically in Fig. 2. The top illustration shows a conventional flow instrument located on the instrument board, requiring attention at three different points, namely, at the transmitter, at the control valve, and at the panel instrument. The lower illustration shows a flowmeter, but the actual control instrument is at the pipeline near the control

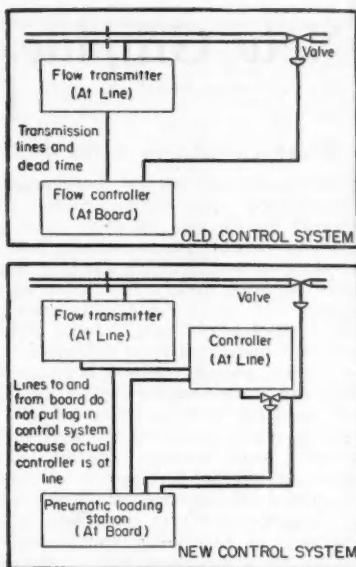
Fig. 1. Elliott Central Control Desk with Graphic Flow Sheet and Inserted Control Instruments



(Courtesy Elliott Brothers (London), Ltd.)

valve, and only a controlling and adjusting unit is on the graphic panel, which is of considerably smaller size than standard instrument panels. Graphic panels have first been developed in the U.S.A. for oil refineries and large chemical plants. Fig. 3 illustrates part of a graphic control panel, designed by Mr. David Boyd, Universal Oil Co., of Philadelphia, in co-operation with the Minneapolis Honeywell-Brown Company, and described in detail in a recently published paper. Fig. 4 illustrates an electronic receiver, as used on this panel for remote supervision and readjustments. Transmission of control impulses is pneumatic, and Fig. 5 shows the diagram of a transmitter unit for flow measurement. The float of a mechanical rate-of-flow meter of the headmeter type, working on differential pressure, actuates a spring-loaded flexible metallic bellows in the transmitter casting. The control mechanism varies air pressure to a pneumatic pilot valve mechanism, which produces the transmitter (output) pressure supplied to the graphic panel unit.

The question of whether to use pneumatic



(Courtesy Chemical Engineering)

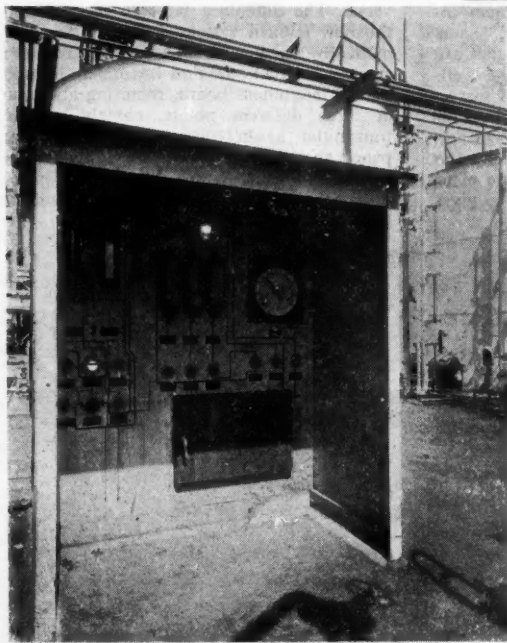


Fig. 2. (Above) Showing Standard Panel and New Graphic Panel Control

Fig. 3. (Left) Graphic Control Panel in open air cubicle

(Courtesy Universal Oil Products Co. and Minneapolis Honeywell-Brown Regulator Co., U.S.A.)

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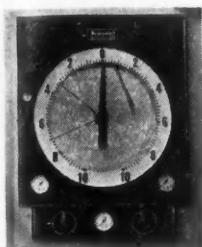


Fig. 4. Electronic Receiver Instrument for panel distillation

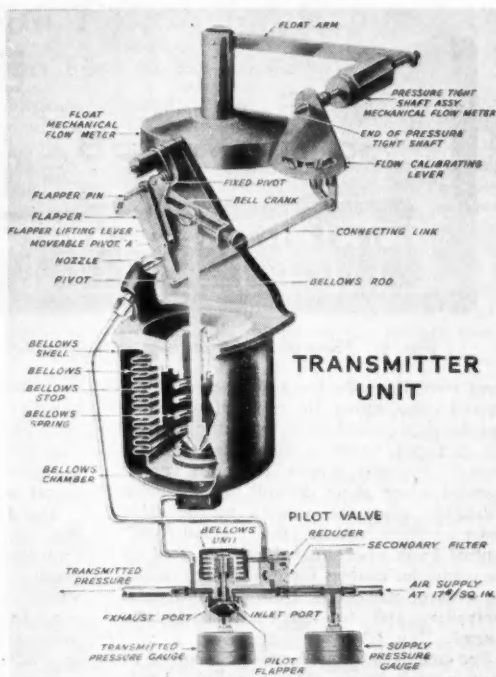


Fig. 5. Diagram of Brown Transmitter Unit

(Courtesy Minneapolis Honeywell-Brown Regulator Co., Philadelphia (British Associates: Honeywell-Brown Ltd., Perivale, Middx.))

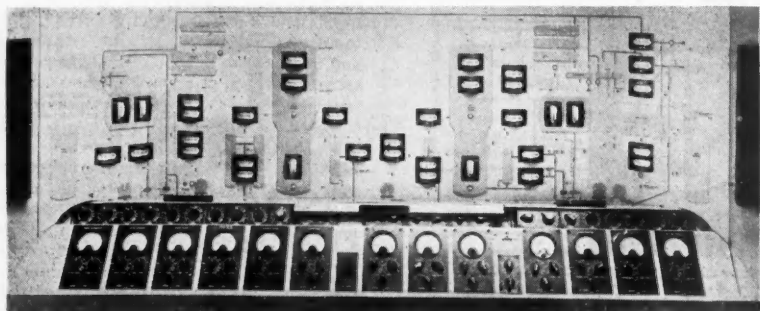
transmission or electronic-pneumatic transmission between transmitter instrument and receiver instrument on the graphic central control panel has not been decided yet. It seems that for smaller plant and short distances the pneumatic system can be used with advantage, but for large plants and very big distances electronic transmission seems preferable. The electric control impulse is converted very near the regulating unit, which may be a diaphragm valve or a pneumatic lever motor, into varying output air pressure from a convactor.

Evershed & Vignoles, Ltd., London, W.4, have recently introduced a new range of process control instruments applicable to the oil industry, chemical works, steelworks, and other manufacturing concerns. The new instruments which operate on the Evershed electronic repeater system facilitate considerable flexibility of layout and have the advantage that control is effected without time lag over almost unlimited distances.

The Evershed process controller is an

electronic-pneumatic equipment providing proportional or three-term (i.e., proportional, integral and derivative) forms of control. It is used in conjunction with any standard transmitter operating on the Evershed electronic repeater system. This transmits a small D.C. current signal through a recorder or indicator to the controller which exercises control over a final element, usually an electro-pneumatic relay accurately positioning an air-operated valve. The Evershed circular chart recorder has been specifically developed for use with this apparatus.

The Evershed process controller is housed in an aluminium alloy case arranged for panel mounting, and is suitable for installation in dangerous atmospheres. Its operation is independent of variations in supply voltage, or frequency, and of resistance in the signal lines. Each control function has its own circuit, thus permitting the separate adjustment of settings and completely independent action of each term. Four pointer knobs moving over calibrated scales on the



(Courtesy Evershed & Vignoles, Ltd.)

Fig. 6. Flow diagram with inserted control units of 'Controller'

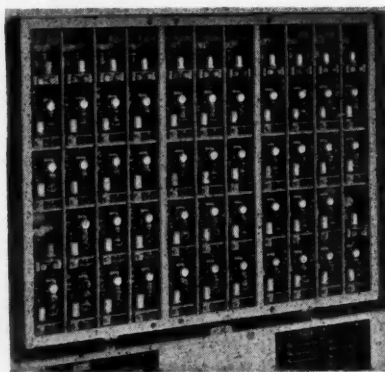
front cover provide for adjustments of the desired valve setting, the proportional band, and the integral and derivative settings. They are mounted under a hinged glass cover secured by two screws rendering unauthorised access more difficult. A miniature instrument gives the position of the valve under control, while the 'Hand-Auto' control knob also situated on the front of the controller enables the operator to isolate the control valve unit from the automatic controller, and to operate it manually instead. (Fig. 6.)

The controller components are mounted in trays housed inside the controller. These have multi-pin plugs which engage in sockets in the back of the case and thus facilitate rapid servicing by replacement, all similar

units being interchangeable. The first tray contains the measuring unit and is used either with one carrying the proportional unit for exercising proportional control only, or with a three-term unit tray comprising both integral and proportional units (Fig. 7).

The Evershed electro-pneumatic relay is the final element normally used with an Evershed process controller for the accurate positioning of a pneumatically-operated valve. It receives a small D.C. electrical input from the controller, and has an output in terms of air pressure which is converted into valve position by means of a mechanical feed back device. The relay incorporates a coil, receiving the current, and operating in the field of a permanent magnet. This coil is mounted on one end of a pivoted beam, the other end having a flapper covering the nozzle of a low breed air relay. An advantage of the electro-pneumatic relay is that the valve position is directly proportional to the input signal, irrespective of air pressure variations and the friction loading on the valve. The relay may be operated in inflammable atmospheres without precaution, and is housed in an aluminium alloy case having both air and electrical connections, and clamps for mounting on the valve under control.

(To be concluded)

**Fig. 7. Back view of Evershed 'Controller' Graphic Control Desk. Showing tray units with electronic valves**

A project by Marchon Products to construct a sulphuric acid plant at its works, with the recommendation of the Health and Housing Committee, is being considered by Whitehaven Town Council. The plant is estimated to cost £2,250,000 and will process locally mined calcium sulphate.

More German Potash for Export

Natural Gas Find at Wolfskehlen

THE decline in production of chemicals in Western Germany which continued in July and August shows little evidence yet of the expected autumn improvement. In August production, according to the official index, was down to the January level, having thus lost the whole of the gains noted earlier this year. While the shortage of coal is no doubt mainly responsible, demand from the chief consuming trades has eased off noticeably, even for those chemicals which until recently were difficult to secure and—which consumers might therefore have been reasonably expected to wish to build up stock.

Potash production also suffered a slight setback during the summer, due to the usual falling-off of calls from farmers, the coal shortage and holiday influences. Nevertheless West German potash producers hope to reach in 1951/52 the record output of 1,100,000 tons (K_2O) which has not been equalled since 1913. If this hope is fulfilled, there will be more potash available for export.

In 1950/51 when potash consumption in Western Germany was the highest since the war and even exceeded the pre-war level, some 660,000 tons were absorbed by the home market; the consumption of 46.7 kilograms per hectare compared with an estimated ideal average dosage of 60 kilograms. While there is thus still scope for a further rise in domestic sales, the home market is not likely to absorb more than 700,000 tons in 1951/52, leaving some 400,000 tons for export. This figure compares with actual exports in 1950/51 of 344,000 tons valued at £7,500,000.

Even Higher Production

It is believed that foreign markets can absorb the increased tonnage likely to be available and the potash industry is endeavouring to raise production still further. The main obstacle at the moment is the shortage of coal. In addition to the allocation of domestic coal at normal prices, potash producers use about half as much coal again at the higher prices ruling in the free market. This and the rise in freight rates on the German railways has caused producing costs to rise.

Salts mined at Königshall-Hindenburg and Bokeloh, the two big mines reopened to meet demand, are more suitable for the export trade than others because of the high (26-27 per cent) K_2O content, but the efforts to develop new deposits continue unabated. In Baden where older mines are approaching exhaustion a new shaft is being drilled near Buggingen, on the eastern bank of the Rhine, to tap deposits lying on the line of continuation of the potash deposits found at Neubreisach, Alsace, on the western side of the river.

Crude Oil Record

Crude oil production in Western Germany reached a new record in August when 120,153 tons were produced, compared with 98,830 tons in the corresponding month of 1950. Substantial increases in output were again achieved in the Suderburg district of Lower Saxony. Here and in the adjoining district of Uelzen several more test drillings are under way.

Great hopes are entertained with regard to oil deposits believed to exist in Hesse. Here what appears to be a very large deposit of natural gas has been found at Wolfskehlen at a depth of only 3,000 feet. Geologists hope to strike oil at a depth of 5,500-6,000 ft. and have been pleasantly surprised by the find, but so far will not commit themselves to any definite opinion on its long-term value.

In the refining year ending next June, West German oil plants are expected to deal with a total throughput of 5,800,000 tons of indigenous and imported crudes, one-quarter of which would be obtained from domestic wells if the August output rate is, as expected, maintained. Most of the remainder is to come from the Middle East, and one-third of the total is to be treated in the hydrogenation works of Gelsenberg and Wesseling. Other plants have been enlarged and several refineries which used to concentrate on German crudes will help to treat imported oils. Throughput is to be raised by over one-third.

The first butadiene to be made in Western Germany was produced by Chemische Werke Huels, Marl, last month. Production of buna, however, will not begin before

November, while perbunan (75 parts butadiene and 25 parts acrylic acid nitrile) will be made at Leverkusen. A new improved process is being used at Marl based on the direct conversion of cracking gases into butadiene, four of the 18 furnaces only are being used. Investments totalling Dm. 20,000,000 will be required to convert the whole plant to the new process.

German dyestuffs makers who last year reached an export turnover of Dm. 170,000,000 have been very active this year in extending their range of production. Farbenfabriken Bayer, Cassella Farbwerke Mainkur and Badische Anilin- und Soda-Fabrik have publicised the introduction of a number of new dyes, chiefly for vegetable fibres, into their production programmes.

The Instrument Industry

SIMA's Rôle in Growth and Development

MODERN science has its roots in measurement, and measurement means instruments. But for the scientific instrument-making industry, scientific research as we know it to-day would virtually cease, and with it our manner of living too. These words by Sir Ben Lockspeiser, secretary of the DSIR, taken from his foreword to the recently published 1951 edition of the Directory and Handbook of the Scientific Instrument Manufacturers' Association of Great Britain, Ltd., emphasise the importance of the association, which represents an industry with an annual product of £50,000,000 in the home and export markets.

Founded in 1916 as the British Optical Instrument Manufacturers' Association, it soon attracted members whose interests were not solely confined to optical instruments, and in 1935 the present title was adopted, the better to represent its growing scope and membership, and is now divided into seven sections which are described in the handbook.

Section I dealing with optical glass and instruments associated with it, microscopes, binoculars, cameras and the like, was the original section of SIMA and comprises 38 member firms.

Of the 22 firms which make up section 2 of the association the majority are concerned with the manufacture of nautical, aeronautical, surveying, and meteorological apparatus. Advances in these fields during

recent years have been so sensational that the science of navigation both at sea and in the air, has been revolutionised. Radar is an outstanding example.

Engineering measuring instruments form Section 3, and in this field of production notable advances were made by British manufacturers during the war. The use of supersonic energy, as in the echo-sounder, for detecting and locating internal defects in the structure of materials has recently come into marked prominence. In the space of a few years from the first experimental model, the supersonic flaw detector is claimed to be more accurate than X-rays and to reveal hair-line cracks in steel.

Section 4 is devoted to laboratory, research and medical apparatus, and in recent years the quantity and quality of laboratory tools has been greatly advanced.

Recent developments in ophthalmic lenses (Section 5) have helped to ensure that the whole of the present home market demand for spectacle lenses is now being met by home production.

Section 6 was formed to co-ordinate the activities of member firms interested in the manufacture of electronic equipment and comprises 38 members. Formation of the section coincided with the celebration of the 50th anniversary of the discovery of the electron by Sir J. J. Thomson at the Cavendish Laboratory, Cambridge, in 1897. The electron tube has provided a tool of inestimable value both in industry and in the development of scientific instruments.

Industrial Instrumentation

The increasing importance of industrial instrumentation has led to the final group, Section 7, which is in the process of formation. Firms in it are devoted to the manufacture of instruments for automatic control in the chemical, oil, engineering, electrical and other process industries. They are concerned with such instruments as temperature controllers, flowmeters, pressure recorders and boiler-house instruments which use a wide range of scientific techniques.

In addition to the information on the history of the British scientific instrument industry and the growth and activities of the British Scientific Instrument Research Association, the principal features of the handbook are a directory of 106 members of the association and a classified index giving the sources in the U.K. of 2,500 instruments.

Analysts Meet

Papers Read and Discussed in London

AN ordinary meeting of the Society of Public Analysts and Other Analytical Chemists was held at 7 p.m., on Wednesday, 3 October, in the meeting room of The Chemical Society, Burlington House, Piccadilly, London, W.1. The chair was taken by the president, Dr. J. R. Nicholls, C.B.E., F.R.I.C.

The following papers were presented and discussed:—

'A Critical Investigation of the Use of the Silver Reductor in the Micro-Volumetric Determination of Iron, especially in Silicate Rocks,' by Christina C. Miller, Ph.D., D.Sc., F.R.S.E., F.H.-W.C., and Robert A. Chalmers, B.Sc.

Hydrogen peroxide is produced, even in small reducers, if air-free hydrochloric acid is not used, and this prevents complete reduction of ferric salts. The use of acid saturated with carbon dioxide reduces the error to negligible proportions.

Unstable end-points obtained in the titration of ferrous iron, subsequent to fusions with potassium bisulphate in platinum crucibles, are most probably caused by the present* of platinum II, which reacts very slowly with ceric sulphate. In general, the error in the determination of iron is insignificant if, near the anticipated end-point, titration is not delayed and the first colour change of the indicator noted. The use of gold crucibles eliminates all uncertainty. Results were shown for the determination of 0.03 to 0.6 mg. amounts of iron, alone and in a number of silicate rocks.

Desiccators Improved

'A Technique to Improve the Efficiency of Desiccators,' by J. King, O.B.E., F.R.I.C.

The inefficiency of the usual type of desiccator has been noted by several workers. After a study of the usual methods, the author has greatly increased the efficiency of the desiccator by a simple modification, namely, the placing of a cylinder of perforated zinc in the upper compartment of a Scheibler desiccator and filling the annular space and the base with desiccant. The most suitable desiccant is calcium carbide in lumps about half an inch in diameter.

Figures showing the absorption of moisture by flour previously dried at 110°C., samples of which were placed in the modi-

fied calcium carbide desiccator and in the usual calcium chloride desiccator of Scheibler pattern, showed the improvement in efficiency.

'Controlled Potential Electrolysis in the Analysis of Copper Base Alloys,' by G. W. C. Milner, B.Sc., F.R.I.C., A.Inst.P., and R. N. Whitem, B.Sc., A.R.I.C.

Details were given of a simple electronic instrument that had been built for automatically controlling the potential of the cathode with respect to a standard reference electrode in electro-gravimetric determination of metals. With this instrument a scheme for determining the majority of the usual alloying constituents of copper-base alloys on a total sample weight of 1.0 g. had been successfully tested. In addition to the electrolytic equipment, an absorptiometer was necessary for the determination of iron, manganese and nickel. The instrument was shown.

Institute of Metal Finishing

THE Council of the Electrodepositors' Technical Society announces that, in accordance with a resolution passed at the last annual general meeting, application which was made some time ago for official incorporation has now been granted and as a result the Society is now an incorporated body.

At the same time application was made for permission to adopt a new title embracing metal finishing generally (excluding only vitreous enamelling). This is in accordance with the general policy of the Society to extend its field beyond electro-deposition processes to include metal finishing generally with which the bulk of its members are vitally concerned.

The new title by which the Society will henceforth be known is The Institute of Metal Finishing incorporating Electrodepositors' Technical Society Limited.

As a result of this change the original aims and objects of the Society—namely, to promote the study of, and disseminate information on, electrodeposition and cognate processes as widely as possible—are in no way affected and will, in fact, be pursued as vigorously as ever. The sphere of interest has now been significantly widened and the Council is of the opinion that this will bring with it corresponding benefit to the membership.

British Firms Encouraged

Oil Equipment Industry's Prospects

CONSIDERABLE encouragement was given to members of the British oil equipment industry by Mr. Howard F. Page, director of the Esso Petroleum Company, Limited, and Shareholders' Representative of the Standard Oil Company (New Jersey), when he spoke at the first annual general meeting of the Council of Manufacturers of Petroleum Equipment at the Dorchester Hotel, London, on 4 October. Due to the tremendous increase in refining capacity in Europe in the past 12 years, tremendous opportunities had been provided, he said, for the British industry which itself had expanded greatly since the war.

Situation Has Altered

Before 1939 the centre of oil refining was in the United States and high-grade crude oil in large quantities could be purchased, loaded aboard tankers at Gulf ports, for as low as 35s. a ton. The discovery and development of oil fields in that country, however, had become more difficult and thus more costly, whereas the development of crude oil in other areas, especially the Middle East, had become more and more economic. Refineries built to operate on Middle East crudes had been expanded and new ones constructed.

'With the growing demand for energy there is every reason to assume,' said Mr. Page, 'that there will be continued expansion in the future in crude oil finding and development, in refining, in pipe line and tanker transport, in storage and distribution facilities.'

'The oil industry is progressive and often moves rapidly when it finds a better, more economic way of supplying its products to the public. The tools for doing its jobs are all-important. The imaginative manufacturer who constantly improves the tools he has to offer and who finds new tools to do the job better, has a ready customer. New ideas seldom come merely from a stroke of genius. Usually they involve hard work—examining the problem, trial and error, testing and then selling. I think you will find oil companies and oil men only too willing to help in any new developments which hold any promise of better tools. Simply in this field alone, your association has, I think, a long-term justification. That

is, it can act as a catalyst and as an efficient channel for the flow of information and ideas between the oil industry and the manufacturers. Such a channel, to be fully effective, must be two-way. Oil companies would be well advised, I feel, to examine carefully all the facilities which your Association provides for the dissemination of information and ideas on equipment.

'In looking to the future there is a field I have not touched upon. Petroleum is an excellent low-cost raw material for almost unlimited chemical manufacture. Equipment investments involved in the segregation of feed stocks and synthesis of basic chemicals are very large. Manufacturers of refining equipment should find this an interesting future outlet. I predict that even after present refinery projects are completed, there will not be any standstill. The rapid expansion of basic refining capacity may slow down to merely the level of increasing consumption, but I would expect basic chemical production to increase at the same time and take up any slack.'

ICI Appointments

DR. GEOFFREY ISHERWOOD HIGSON has been appointed chairman of the Billingham Division of Imperial Chemical Industries, Ltd. He was educated at Bickerton School, Southport, Liverpool University, and the Technische Hochschule, Hanover. In 1918 he went to the British Photographic Research Association where he remained for four years. Dr. Higson joined I.C.I. at its Billingham Laboratories in 1922, and from 1931-1940 he held posts as delegate director and division manager of nitrogen process and technical department manager, and was then seconded for a year to CIL, Canada. In 1942 he was appointed technical director becoming joint managing director six years later.

DR. RONALD HOLROYD whose appointment as a managing director of the Billingham Division is announced, was educated at Sheffield University and joined the I.C.I. Alkali research department in 1928, moving to Billingham two years later. Since 1930 he has been section manager oil research, oil research manager, and oil technical manager, until he became divisional research manager in 1947. In May that year he was appointed divisional director and in September this year joint managing director.

Education & the Manpower Shortage

A.I.Ch.E. Discuss American Viewpoint

AT the national meeting of the American Institute of Chemical Engineers held recently, a discussion was held on the possibility of improving the curriculum for would-be chemical engineers. Dr. R. H. Boyd, visiting professor of Columbia University, expressed the opinion that in an undergraduate course, a broad training based on scientific fundamentals was the best curriculum developed to date. Time did not permit of higher specialisation in these courses, which should be accomplished by post-graduate work or by actual experience in industry. Among other improvements which could be made in the present courses, he suggested: (1) improving the capacity of the engineering student for self-expression; (2) the stressing of honesty and integrity by example and discipline; and (3) the addition of a course in common sense.

Dr. G. Brown, who serves on the committee of the Institute responsible for accrediting undergraduate curricula, said that the Institute was the first engineering body to accredit the courses of technical schools. At first, in 1923, only 21 per cent of schools met the standard, but to-day 60 per cent of schools offering chemical engineering courses were accredited. He added that from the viewpoint of the committee, the curricula were effective in training sound, creative chemical engineers. In these curricula, he declared, there must be an adequate background of mathematics, as well as the sciences, good design courses, qualified instruction, adequate laboratory facilities and sufficient financial support.

More Summer Jobs

Mr. W. T. Nichols, director of Monsanto Chemical Company's general Engineering department, spoke on how industry and the colleges can co-operate in improving chemical engineering education. From the results of a survey he had carried out covering 400 industrialists and teachers, he said, it seemed that great improvements could be achieved in technical education by providing more summer jobs for teachers and students, by increasing the number of graduate fellowships, and by allowing teachers to spend, say, one year in industry for experience. It

would also be better to make more use of teachers as consultants and to have more speakers available to address student gatherings.

Suggestions Implemented

In an effort to implement these suggestions, Mr. Nichols said, he and his associates instituted in 1949-50 a required course of 32 lectures at Washington University delivered by 24 engineers from the General Engineering Department of Monsanto. The succeeding year the plan was taken over by the St. Louis branch of the American Institute of Chemical Engineers, who expanded the course to 42 lectures and obtained lecturers from eleven different industries. A similar course now exists at St. Louis University, and Mr. Nichols said he hoped that local sections of the Institute would follow suit. Such courses, he said, would benefit all professions.

Discussing at the same meeting the engineering manpower shortage and what they could do about it were several other leading figures. Mr. C. H. Brown, chairman of the Engineering Manpower Commission of the Engineers' Joint Council, illustrated the magnitude of the shortage with figures. In 1951 and 1952, he said, the need for engineering graduates had been estimated to be 95,000 in industry and the armed forces. As compared with this, the supply for 1951 was 38,000, and for 1952 would be 23,000. The estimated needs would taper off gradually to about 55,000 per year by 1960, but the supply of graduates would probably level off at about 18,000 from 1953 onwards. And this, he said, at a time when engineers were vital for supplying us with weapons superior to our enemies so as to offset their greater numbers, as well as for maintaining a sound civilian economy sturdy enough to support the military programme.

Dr. G. Brown, Dean of Michigan University's Engineering College, pointed out that America's technical superiority may be threatened because the Russians are turning out 50,000 engineers per year at the moment, and will continue to do so. For those who were afraid of the possibility of training too many engineers, he said that engineering training was the best possible background

for an industrial career, as witnessed by the fact that the majority of men in the top management of industry to-day were engineers.

Mr. D. W. Durham, of Du Pont, brought out the point that while industry is aware of the engineering manpower shortage problem, there was no unified movement to recognise the problem on a national level. He suggested that the shortage should be publicised as widely as possible so that the public, the government and industry would start to take action. He suggested closer contact between industry and high schools in order to obtain a fair share of students for engineering training and also suggested that to conserve engineers in the immediate future these should be used more effectively by industry.

Carbonisation Scheme

A COMPREHENSIVE coking plant is to be erected at Wingerworth, three miles south of Chesterfield, in its East Midlands Division, by the National Coal Board. The project, to be known as the Avenue Coking Plant, will incorporate features not only of British operational and research experience but also of the latest American and German developments.

Estimated cost of the project is £8,000,000. The installation will consist of 106 ovens capable of carbonising more than 750,000 tons of coal annually, and will produce 500,000 tons of coke and large quantities of gas for local distribution.

In addition to extensive coal blending facilities and the normal primary by-product plant associated with modern carbonisation practice, Avenue will have a benzole rectifying plant, tar distilling plant, gas purifying equipment and a sulphuric acid plant. About 3,000,000 gallons of crude benzole and 6,000,000 gallons of crude tar will be produced annually from which products of primary importance to the chemical industry will be processed.

The greater part of the construction work involved has been entrusted to Woodall-Duckham, Ltd., of London, with which the main order amounting to £4,750,000 has been placed. This is the largest single contract placed by the board since the industry was nationalised.

A feature of the project will be the fuel

economy achieved, for the plant has many features designed to conserve to the utmost the heat and power requirements of so large an installation.

U.S. Anti-Trust Nylon Suit

ACTION to break an alleged nylon monopoly of the American chemical combine of E. I. Du Pont de Nemours, is reported to be planned by the U.S. Government.

Compulsory licensing of the firm's nylon patents is sought, according to Mr. Leonard Emmerglick, special assistant to the American Attorney-General, so that other manufacturers can use the process.

A ruling made in the U.S. Federal court recently found that Du Pont, Imperial Chemical Industries of Great Britain, and the Remington Arms Company had conspired to divide markets in munitions, chemicals and small arms in violation of the American anti-trust laws. Infringement of the laws was denied by the firms.

An I.C.I. statement reported in the *Financial Times* says that without the full 200-page report of Judge Ryan no authoritative comment was possible.

The lawsuit was instituted by the U.S. Government in 1944, and is concerned with questions of American and not British law. I.C.I. is involved because it operates in the U.S.A. through its subsidiary company I.C.I. (New York). It should be, however, remembered that it is a civil action and phrases such as 'guilty' and 'combination and conspiracy' should not be construed in the British sense of those words.

Further hearings will take place before the terms of any court decree are settled, and the opinion of Judge Ryan 15 months after the close of the main hearings is not, therefore, final.

To Show Experts

Mr. John Boyd arrived at Liverpool from Canada in the Cunard liner *Franconia* on 4 October with a specimen of rock to show British experts. He picked it out of 1,000 feet of rock at Seven Islands, in the province of Quebec, on one of his annual prospecting trips. Canadian geologists have agreed that the rock has radio-activity. 'There is enough uranium there to last 50 years,' said Mr. Boyd, a Scot, who emigrated to Canada as a prospector 25 years ago.

Chemicals in South Africa

Shortages Affecting Local Industries

SHORTAGE of industrial chemicals in South Africa continues to be of considerable concern to local industries and there is still some doubt as to whether all the factories will be able to continue production if the position does not improve shortly. Where stocks of chemicals can be supplied, quantities available are often limited and the prices high. Blame has been attached to the Government for the present situation as it is considered in some quarters that import restrictions were relaxed too late, although it is also admitted that the re-armament programme has aggravated the position.

As in England, the shortage of steel drums is acute and this has helped to reduce the available supplies of certain industrial chemicals in liquid form. African Explosives and Chemical Industries has, however, been making every endeavour to supply all normal demands for certain heavy chemicals.

It is expected that the South African oil-from-coal factory and the crude oil refining plants will eventually be able to supply sulphur, but it will be some years before they can have any effect on the local position. In the meantime shortage of sulphur overseas has affected local supplies of aluminium phosphate.

There is a local shortage of caustic soda and in spite of efforts to obtain larger quantities from Britain it seems that this problem will persist for some time to come.

Current shortage of soda ash is said to be due mainly to the transport difficulties in East Africa and to shipping problems. In recent years South African glass works have imported large quantities of soda ash from East Africa and they are still seeking to obtain supplies from that source, where the quantities available are adequate. It has been possible to obtain sufficient bauxite to keep industry going, and there are indications that in the near future all the Union's needs in this direction will be met.

A sugar milling research institute is being erected near the Natal University, which will investigate many of the problems of the sugar industry. At the laying of the founda-

tion stone the managing director of Natal Estates, Ltd., said he could remember when chemists were unknown in the sugar industry. Process losses were then heavy and it took over 20 tons of cane to yield a ton of sugar. Chemists were, in fact, for some time viewed with suspicion, but now they were vital to the industry. The new institute is complementary to the experimental station at Mount Edgecombe. It is expected that it will cost some £10,000 a year to run and the value of the building and equipment is estimated at about £30,000.

Plans for the local manufacture of anhydrides and synthetic resins from naphthalene have been announced by the Berger group of paint companies which has its headquarters in Durban. Final details of the project have not yet been disclosed.

Advantages over other types of plastic are claimed for a new plastic reported to be the result of five years' research in the laboratory of Regi (Pty.) Ltd., Port Elizabeth. Essential chemicals are said to be inexpensive and the plastic, according to the company, can be cast in plaster of paris or in soft metal moulds. Further claims are said to be its resistance to acids; a degree of flexibility or not, as required; and it can be made extremely hard, yet at the same time remarkably light. Composition of the plastic has not been revealed.

Glucose and Starch Products, Ltd., Bellville, Cape, is now in active production in its new £500,000 factory. Capital for this enterprise was provided by the Manbre and Garton group in London, which also undertook the main planning. British technicians have arrived to take technical control of the process and also to supervise the chemical and mechanical aspects of the work. The factory, one of the most modern of its kind in the world, is now producing liquid glucose, cornflour, starches, modified starches and dextrins.

SCI Food Group

Hospitality Fund Appeal

MANY years ago the committee of the Food Group of the Society of Chemical Industry approached its members for contributions to a fund to help in financing the type of social activity for which the group has since earned a high reputation. During the past year the fund has been exhausted, and a fresh appeal has become necessary.

Legislation under which the society holds its Charter does not permit the use of ordinary funds for the entertainment of its own members. The committee's object has always been that such activities should make neither profit nor loss.

That losses, should over a period of time, exceed profits was almost inevitable when the increased costs of catering and the endeavour to keep charges within the means of younger members are considered.

Majority Support Plan

It is believed that the holding of a reasonable number of social or partly social, partly scientific functions has the support of the majority of members.

Further encouragement is found in the readiness with which many firms have offered and given hospitality to members of the group and their invited guests both British and foreign.

The conversazione, a function that has been attended from the outset with immense success, has been supported three times by the hospitality of industrial firms, but the committee cannot ask for the indefinite repetition of this generosity. The primary object of such a function was to provide opportunities for social contact among the younger members of the group. Present costs of catering would completely destroy this object if the functions were to be self-supporting since charges would certainly deter the very people it was hoped to attract.

To ensure the continuance of these activities it is felt that members and their firms will gladly contribute to a new hospitality fund.

Cheques should be made payable to the Food Group Hospitality Fund and addressed to: Mr. E. Mitchell Learmouth, M.Sc., F.R.I.C., Hon. Treasurer, Food Group, British Soya Products, Ltd., 150/2 Fenchurch Street, London, E.C.3.

Pharmacists' Conference

French Visitors at General Meeting

FOUR guests from France attended the half-yearly general meeting of the Association of the British Pharmaceutical Industry held at Torquay on 27 September. The visitors, who represented the French pharmaceutical industry were M. and Mme. Robert Chivot and M. and Mme. Robert Midy. M. Chivot is chairman of the Société Anonyme des Laboratoires Pharmaceutiques Corbière, Paris, and is a member of the Central Council of Section B of L'Ordre des Pharmaciens; M. Midy is vice-president of the Chambre Syndicale des Fabricants de Produits Pharmaceutiques.

The meeting endorsed the vote of congratulations passed by council to the pharmaceutical team which recently visited the U.S.A., for its thorough and constructive report. It was unanimously agreed that the association should set up a special committee to examine the report in detail and advise communal action where appropriate. Although a number of the recommendations contained in the report must depend for their implementation on action by individual managements, there was clearly a field in which combined action could and should be taken by the association, if full value was to be obtained from the experience of the team in America.

An example which the meeting agreed should receive particular attention from the committee was the suggestion that liquids should be sold by volume instead of by weight. Mr. H. G. Rolfe, B.Sc., Ph.C., F.R.I.C., leader of the team, has accepted the invitation to be chairman of the committee.

Discussion took place on the recent re-imposition by the Ministry of Food of control of maize starch, maize dextrine, farina (potato starch) and home produced farina dextrine, as a result of which the association had been asked by the Ministry to undertake the detailed work in regard to individual allocations. This was carried out during and immediately after the war. by the Pharmaceutical Export Group.

Oil Loan for Burma

Britain has promised to lend Burma £2,500,000 towards financing the Burmese Government's share in the proposed oil venture with the Burmah Oil Company for producing and refining the country's oil.

Training of a Technologist

Professor F. H. Garner's Redwood Lecture

EDUCATION and training of the technologist were discussed by Professor F. H. Garner, O.B.E., M.Sc., Ph.D., in his Redwood Lecture, delivered on 3 October to the Institute of Petroleum in London.

Professor Garner, who is director of the department of chemical engineering, University of Birmingham, said most scientists would agree that some knowledge of the humanities should be included in their training, but by no means all humanists considered that a knowledge of science should figure in theirs, although a man without some understanding of scientific methods and achievements suffered a serious impoverishment in his whole intellectual life.

Personal Contact

In addition to some knowledge of the arts, the applied scientist needed special personal qualities of leadership which could only be gained by personal contact.

Referring to the feeling current to-day that recent developments in science had endangered mankind's future and that this was in some way connected with the deficiencies in training and outlook of scientists, Professor Garner said that the results of scientific discovery could be applied well or ill and it was the standard of intelligence and moral standards of the whole of the educated communities, not those of the scientists alone, which formed the decisions. Had not the whole of the British educational system until the last 50 years been inspired and conducted by those trained in the humanities? And the result of such training through hundreds of years was now said to be that the educated section of the community was unfitted to deal with to-day's problems.

Considering the broader aspects of training, the professor refuted the idea current in some quarters that applied sciences were out of place in a university and that modern engineering education consisted of a series of snippets of subjects with no real grounding in any branch of science whatever. Some thought that engineers should be taught only applied mathematics, modern physics and recent advances in chemistry for three years and learn engineering in a graduate course. But surely the assumption that everything labelled 'mathematics',

'physics' or 'chemistry' was basic or fundamental was wrong. It was a fallacy to assume that knowledge could be allocated into boxes when in point of fact there was an immense borderline, such as for example physical chemistry, which was taught in chemistry departments but might equally well be taught in physics departments.

Discussing the factors necessary for a successful university training, the speaker said he considered that the technologist required a fuller series of lectures, tutorials and practical classes than was necessary for an arts student and these must be so directed that they led to the development of the potentialities of individual personalities.

Full knowledge of the working and requirements of industry could only be acquired in industry itself, but the teaching of why different techniques were used and the principles on which they were based could well be taught at the university. Contact with industry at home and abroad should be maintained through vacation courses.

Professor Garner concluded by expressing the hope that graduate schools, so long an integral part of technological training in the United States, might soon be firmly established in Britain.

British Sulphur Corporation

ANNOUNCEMENTS have recently appeared in the Press regarding the formation of a Sulphur Exploration Syndicate composed of the principal consumers of sulphur in the United Kingdom, and having for its object the systematic exploration of sources of sulphur all over the world which might be eventually exploited for the benefit of this country and international trade.

A limited company, The British Sulphur Corporation, Ltd., has now been registered with a nominal capital under the auspices of the syndicate. The purpose of the registration of this company is to provide a vehicle for the exploitation, if required, of properties considered of interest by the syndicate. The eventual form of the company, its final directorate, and finance, are all matters which will be decided in the light of future requirements.

Members of the syndicate will not necessarily participate financially in the activities of the company, and the amount of finance required and its source are undecided.

Photography in Industry

American Engineers Hear Papers

PHOTOGRAPHY has become as important to the engineer as his slide rule, the manager of Eastman Kodak's industrial sales division, told the American Institute of Chemical Engineers recently at their national meeting in Rochester, N.Y. It provides, he said, a 'four power' tool for the engineer because of its ability to analyse, record, communicate, and dramatise.

He revealed that the industrial use of photography has been greatly accelerated by recent conversion to large-scale defence production. A recent Kodak survey of a section of American industry employing more than 100 persons showed that 61 per cent of chemical industries, 49 per cent of food and drug manufacturers, and 65 per cent of paper and allied products manufacturers are equipped with their own photographic facilities.

Service Improved

Speaking on 'Photographic Organisation Within a Chemical Industry', R. C. Kinstler, head of the photographic laboratory of the Proctor & Gamble Company, also pointed out the trend toward company-operated photographic facilities. 'In recent years, for example, we have centralised the responsibility for photographic applications in our company. We have found that, in addition to operating economies, centralisation of our photographic work results in improvements in our service and higher quality through specialisation and a broader application of functional photographic techniques', he said.

Kinstler pointed out that increased use of 'incidental' or on the job' photography has been an interesting outgrowth of Proctor & Gamble's centralisation.

G. H. Gustat, superintendent of the industrial engineering department at Eastman Kodak Company's Kodak Park plant, described industrial photography as a tool for engineers. 'The limitations of the human eye in seeing in detail what is happening on a fast operation, either mechanical or chemical in nature, makes the use of photography a highly valuable tool to achieve improvement in operations', he said. Training programmes and instruction material also became clearer and more effective if they were supplemented by still and motion pictures.

The use of photography can result in improved machine design, better trained operators, reduced waste, uniformity of operation, and reduced costs, said Gustat.

Oldbury Fire Inquest

No Indication of Negligence

NO indication of negligence by the firm or its employees was found at the inquest held on 27 September to inquire into the death of two men from shock and burns which resulted from a fire and explosion in the research department of Albright & Wilson, Ltd., Oldbury, on 10 July.

The explosion occurred in No. 2 creche when some highly inflammable sodium nitrophenate used in the manufacture of an insecticide was being emptied from the drying trays.

Painters were working on the roof of the gas producing plant next to the research buildings, and George Cutler, foreman, said that it was possible for a cigarette-end dropped from the roof to be wafted through the open doors of No. 2 creche or through one of the ventilators and to have landed near the sodium.

The sodium compound was dried in an oven, then moved in trays and loaded by means of a steel box into drums stated Mr. Bryan Topley, director of research. There were 44 of the steel drums in the building at the time of the fire. He was convinced that the ignition was not caused by an electric fault.

A possible dust cloud of the sodium which exploded immediately after the first ignition might have been caused by the first flash.

In his summary the coroner, Mr. F. G. Playne, said he did not think a satisfactory answer as to the cause of the accident would be found. The theory about the cigarette-end seemed unlikely, but nevertheless it was quite feasible, and there was, apparently, no better explanation.

Price Reduction

Bowman Chemicals, Ltd., announce that their price for dark lactic acid 44 per cent by weight was reduced to £100 per ton, ex works, as and from 1 October, 1951.



The Chemist's Bookshelf

THE PLANT GLYCOSIDES. By R. J. McIlroy. London. Edward Arnold & Co. 1951. Pp. 138. 18s.

In the preface to this book on the plant glycosides the author disclaims any more ambitious intent than that of providing an up-to-date summary of the subject 'for convenient reference'. It is probably true that the subject demands either a voluminous and exhaustive treatment filling several volumes, or the summarised exposition, relying on tabulated data and short comments covering in a general way large groupings of chemically and biologically related compounds, which Dr. McIlroy has in fact given us; and for those whose interest in the subject is indirect—the botanist, the biochemist working in other fields, the medical practitioner interested in the cardiac glycosides—there is no doubt that Dr. McIlroy's choice must be accounted the happier one.

The main chapters are written on a fairly regular plan, each dealing with a series of glycosides whose aglycone group derives from a common parent chemical type, an arrangement that of course implies their sharing a common biological interest. In the chapter on the anthocyanins, for example, a consideration of the relation of the various aglycone groups to cyanidin is followed by a summary of the methods of aglycone synthesis and a selected example (callistephin chloride) of the synthesis of a complete anthocyanin. A sub-classification, and short comments (source, hydrolysis products, structure, references) on each glycoside in the group, completes the author's treatment. The specialist in the field might well ask for more, but the rest of us will be thankful for this slim volume which by its judicious presentation of chemical detail reduces a sprawling subject to readily organised dimensions.

In chapters 1 and 2, however, the book seems to suffer the defect of its virtues, and more substantial introductory chapters would undoubtedly give the book a better balance and be welcomed by a majority of readers. Indeed, the first chapter—'Glycosides'—

with its three pages of text, borders on *lèsemajesté*.

Dr. McIlroy, however, makes handsome amends, and his appendix brings his references and summaries up-to-date as far as October, 1950.—F.N.M.

ALUMINIUM IN THE CHEMICAL AND FOOD INDUSTRIES. 2nd Edition. The British Aluminium Co., Ltd., London. 1951. Pp. VI + 150. Limited circulation.

This book succeeds an earlier volume issued with the same title in 1936 under the auspices of the International Aluminium Bureau. Since that year aluminium has found an increased use for many purposes, not least in the chemical and food industries and this publication deals as comprehensively as possible with its many present and prospective applications here.

The contents of the book are divided into three chapters. The first describes the general properties of aluminium and its alloys and all the characteristics which render the metal a particularly suitable material for use in the chemical and food industries, such as resistance to corrosion, non-toxicity, hygienic qualities, workability, light weight, high thermal conductivities and availability in all forms, etc. Chapter 2 deals with the action of various substances on aluminium and its alloys, divided into the three main sections of inorganic, organic and miscellaneous substances, the arrangement of which is explained and specially indexed. Chapter 3 describes the methods of testing corrosion-resistance, among them preparation of specimens, exposure conditions, assessment and time curves of corrosion, etc. The book contains many tables, graphs and figures, a selected bibliography and comprehensive index.

The publishers present with this book a praiseworthy contribution to technical literature and although its circulation has unavoidably to be rigidly limited, it is hoped that it will be accessible in scientific and technical libraries all over the country.—F.N.

OVERSEAS

Du Pont Save Nickel

The current shortage of nickel has resulted in the resurrection by Du Pont in America of some 1938 research on the electro-deposition of chromium on 'white brass' alloy consisting of 80/20 zinc-copper. The base alloy is electro-deposited from a cyanide bath using special brightening agents. From there chromium is deposited in the usual manner. Automobile and other industries are now carrying out plant tests.

Los Angeles Samples 'Smog'

A continuous five-month programme designed to gather information about what happens to air pollutants as they travel through the air on their way from their source to affected areas has been instituted by the Los Angeles authorities. In addition to tracing the flow of the 'smog', measurements will be taken to find out the reactions that its constituents undergo in the atmosphere due to sunlight, air, etc. Widespread air sampling stations will be set up to measure the constituents of 'smog' such as total aldehydes, formaldehyde, total hydrocarbons, oxides of nitrogen, peroxides, oxidants, sulphur compounds, particulate matter, and carbon monoxide.

Ion Exchange Tap Purifier

Enley Products Inc. of America have recently put on the market a water purifier which, when attached to an ordinary water tap, is claimed to provide 120 gallons of chemically pure water before replacement is required. The device consists of a replaceable plastic cartridge, the resins in which change colour from blue to yellow as they become exhausted. A fibreglass filter traps solid impurities.

Mexican Sulphur Production

Production of sulphur at a gas washing plant on the Poza Rica oil fields of Petroleos Mexicanos soon will be increased to 140 metric tons daily from its present average of 100 tons, according to an official statement by Petroleos Mexicanos, as reported by the daily newspaper *Excelsior*. The nationalised oil administration stated that 6,000 metric tons of sulphur were on hand in mid-August, and that, before the end of the year, at least 8,000 tons will be available for export.

Rubber and Plastics Laboratory

Cornell University has announced recently the establishment of a laboratory to be devoted exclusively to research on rubber and plastics. This is the first of its kind among American colleges and universities, and equipment and funds, as well as a valuable library on rubber, have been subscribed by W. C. Geer, one of the country's foremost rubber chemists. It will be formed in the school of chemical and metallurgical engineering, and research in it is expected to concentrate largely on synthetic rubber problems.

Research Fellowships

The Pakistan Association for the Cultivation of Science has accepted an offer from I.C.I. to provide the sum of £12,000 for research fellowships in chemistry, physics and biology at Pakistan universities or institutions, over a period of five to seven years. Each fellowship will be worth about £27 per month and will be for two years with a possible extension to three. Expenses would be covered by a grant. Choice of candidates will be solely on scientific fitness, and regardless of sex, race or religion, says the Association.

Polyethylene Liners

Leakproof tank liners made of polyethylene are now being marketed in America to reduce maintenance and replacement costs in storage, plating and other tanks which contain corrosive liquids. These liners can be furnished with drains, flows, pipe flanges, fittings and valves also made from the plastic, and which can be connected to existing installations.

£9,000,000 Oil Refinery for Iraq

Contract for the construction of the first Iraqi Government-owned oil refinery to be built near Baghdad has been awarded to the M. W. Kellogg Company of America. Capacity of the refinery is estimated at 24,000 barrels of oil daily or one million tons a year. The total cost is expected to be nearly £9,000,000 and materials will be obtained from the U.S.A. and the U.K. The oil will be conveyed from Baiji to Baghdad, a distance of some 135 miles, through a 12-in. pipeline.

PERSONAL

MR. REGINALD F. NORRIS has relinquished his position with the oil engine division of the Brush Abco Group to become general manager of D.M.M. (Machinery), Ltd., 119 Victoria Street, London, S.W.1.

D.M.M. (Machinery), Ltd., are the accredited English representatives of a group of well-known German engineering firms including Demag A.G., Maschinenfabrik Meer A.G. Miag Fahrsovgbau, GmbH, and Carl Canzler. They are at present heavily engaged in South Wales and the Midlands in large steel works, rolling mill and chemical installations.

Following the annual general meeting of the British Valve Manufacturers' Association held in London recently, the executive committee elected as chairman of the association, MR. N. P. NEWMAN, managing director of Newman, Hender & Co., Ltd. Mr. Noel Newman succeeds Mr. E. BRUCE BALL, managing director of Glenfield & Kennedy, Ltd., who has held the chairmanship for the past three years.

The Glass Manufacturers' Association announces that MISS ROSEMARY GARLAND has been appointed its publicity officer. Miss Garland, who was until recently Press officer with a firm of glassmakers and lighthouse engineers may be contacted at 17 Manchester Street, London, W.1 (Telephone: WELbeck 0461/2/3), offices of the federation which has represented the British glass industry for a quarter of a century.

Presentation of the British Empire Medal to Mr. F. A. Lovett, superintendent of the B.T.H. insulation, varnish, stove enamel, and resin factories took place on Wednesday 26 September. The award was made at the Rugby works by Lord Willoughby de Broke, Lord Lieutenant of Warwickshire, on behalf of His Majesty the King. Mr. Lovett, who has spent 47 years in the service of B.T.H., received the award for his loyal service, diligence and example to younger men. The official citation also stated that: 'The high quality of insulations manufactured under his direct control has contributed in no small measure to the growth of the electrical manufacturing industry.'

MR. J. C. SWALLOW has been appointed chairman of I.C.I. Plastics Division in succession to Mr. P. C. ALLEN who becomes a member of the I.C.I. board and group director responsible for the Plastics, Paints, and Leathercloth Divisions. The new chairman was formerly joint managing director.

Before coming to the Plastics Division in 1942 as research director Mr. Swallow was research manager of I.C.I.'s Alkali Division where the research work leading to the discovery and manufacture of polythene was carried out. He has been associated with I.C.I. since its formation and throughout his scientific career has taken a very active part in plastics research. This year Mr. Swallow delivered a series of Cantor Lectures on 'The Plastics Industry'.



J. C. Swallow



Dr. J. E. Sisson

DR. J. E. SISSON has been appointed joint managing director of the I.C.I. Plastics Division. Dr. Sisson became delegate director responsible for sales in May, 1949. Prior to that he was sales manager in the Plastics Department of I.C.I.'s Southern Region Sales Office for two years. Dr. Sisson joined I.C.I. in 1933 as technical officer at Billingham, subsequently becoming works manager at the 'Mouldrite' factory at Croydon, and in May, 1943, manager of Home Sales Control Department, Welwyn Garden City.

SIR HAROLD HARTLEY, F.R.S., president of the Institution of Chemical Engineers, delivered the fourth Will Harvey memorial lecture on 29 September at Sheffield City Training College, on human relationships in State industries and the need for a continuous process of further education.

HOME

Steel Export Control

Current bulk licences for the export of finished steel to various destinations are being revoked and endorsed by the Board of Trade so as to exclude most foreign countries from their scope. This is being done to ensure proper distribution during the rest of the year. Bulk licensing will, however, continue to Argentina, the Commonwealth, Denmark, Finland, Norway, Portugal and Sweden.

Glycerine Prices Raised

Owing to the increased cost of tins, packing material and labour, Glycerine Ltd., announces that it has been found necessary, as from 1 October, to advance its prices for 14, 28, and 56-lb. tins by 3s. per cwt d/d. The price of glycerine in drums remains unaltered, but an increase in the prices charged for drums has been found necessary to bring them into line with the present replacement value.

Record Progress

An increase in turnover of nearly 500 per cent in five years was referred to by Sir Graham Cunningham, chairman of the Triplex group of companies, speaking at the annual general meeting on 26 September when he paid tribute to the progress of Quickfit & Quartz, Ltd., of Stone, Staffs. Licences had been obtained for additional buildings which were put in hand almost immediately.

Plastics in Surgery

Plastics application to surgery is the subject of an article by Sir Harry Platt, professor of orthopaedic surgery, Manchester, in the current issue of the *Practitioner*. Nylon to prevent bones from becoming fixed, acrylic resin for filling gaps in bone, and polythene bags inside the chest to collapse a diseased lung, were among the examples quoted. This issue of the *Practitioner* is its one thousandth edition. There have only been three interruptions in its monthly publication since it was founded in 1868. Two of these were during the war when the whole issue was bombed after printing, and one in 1947, due to the fuel crisis, when copies had been printed but distribution was forbidden.

Glassworkers' Bonus

As a result of a decision taken at a recent meeting of the profit-sharing committee, all employees of Quickfit & Quartz, Ltd., Stone, Staffs, have received a 15 per cent profit-sharing bonus in their pay packets. The company is a member of the Triplex group, whose chairman and managing director, Sir Graham Cunningham, was one of the first industrialists to introduce a profit-sharing scheme in pre-war years. This is the third yearly bonus to be paid; the 15 per cent is approximately equivalent to eight weeks' pay for each employee.

British Science Centre

On Monday, in a statement about the future of the Festival of Britain South Bank Exhibition site, it was revealed that the new British Science Centre will probably be constructed in this area close to Waterloo Bridge.

After discussing plans for completing the Festival Hall and the National Shakespeare Memorial theatre, the statement said:

'Immediately beyond Waterloo Bridge is a further area ready for redevelopment in the ownership partly of the Council and partly of the Duchy of Cornwall. Negotiations have been proceeding for some time for the acquisition of this site to house the British Science Centre.'

'It is hoped that a "New Burlington House" on the river front facing Somerset House will form the new home of the Royal Society and 15 other leading scientific learned societies. Other buildings will house Government scientific organisations, including the Patent Office and its library, which will be modernised and extended as a central reference library of science and technology.'

To Explore Possibilities

The old lead mines and zinc mines at Leadhills and Wanlockhead which were closed down nearly 20 years ago, will be reopened if new searches for minerals in the area prove satisfactory. The Lanarkshire County Council has approved an application by the Siamese Tin Syndicate, London, to carry through a searching and prospecting programme. The company has acquired exclusive rights to search for minerals within an area of 45 square miles.

Publications & Announcements

THE January to June issue of *The Welder*, published by Murex Welding Processes, Ltd., has just been issued. Articles include one on the formation in Tasmania of Murex (Australasia) Pty., Ltd. together with others on welding in Australia—including a description of an 80-ton electrically welded gantry crane built for the State Electricity Commission of Victoria.

* * *

SUMMARISING the scientific investigations conducted by the National Bureau of Standards during the fiscal year 1950, a 113-page illustrated booklet, just published by the American National Bureau of Standards, contains accounts of current activities as well as more detailed descriptions of especially important scientific developments.

The scope of research and development at the NBS, both theoretical and practical, is indicated by the names of the 13 scientific and technical divisions: electronics, atomic and radiation physics, chemistry, mechanics, organic and fibrous materials, metallurgy, applied mathematics, mineral products, building technology, heat and power, electricity and optics, metrology, and radio propagation.

[*Annual Report of the National Bureau of Standards* for 1950, National Bureau of Standards Miscellaneous Publication 200, 113 pages, 28 half-tone illustrations—50 cents. Government Printing Office, Washington 25, D.C.]

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A HEAT-resistant black bituminous enamel has recently been developed by Tretol, Ltd., and is now on the market. This material, known as Tretol H.R. Black Enamel, withstands temperatures up to 400°C. dry heat and is said to provide protection against weak acids, alkalis, and weather conditions. The coating is designed for the external protection of metal chimneys, stove pipes, etc., and the internal and external protection of fume ductings where heat is encountered but where concentration of chemical fumes is not unduly high. The enamel dries with a brilliant black glossy finish, say the company, and, unlike the majority of bituminous coatings, does not quickly dull on exposure to sunlight. It is touch-dry in 30 minutes, and three coats should be applied.

THE Report of the Specialist Conference on Fuel Research which was convened by the Standing Committee of the British Commonwealth Scientific Official Conference and held in London last year, has now been published. The conference discussed existing facilities for fuel research in the Commonwealth, and the possibilities of improving such facilities and of augmenting present arrangements for liaison, exchange of staff and exchange of information. Special attention was given to ensuring collaboration in selected fields of fuel research, including coal preparation, coke production, gasification, and fuel efficiency. Educational and training facilities in fuel science and technology were also reviewed.

* * *

THE Institute of Metals announces that it will hold a general discussion on 'Metal Economics' at the Park Lane Hotel, London, on 17 October, at 10 a.m. Subjects of papers to be read will include the world supply of non-ferrous metals, including the light metals; metals as natural resources; iron ore—world demand and resources. The second session will be devoted to the subject of scrap reclamation, secondary and substitute metals, and the scope for conservation and economy of scarce metals.

* * *

RECENTLY published by the Pharmaceutical Press is a reprint of a series of articles by John Rae, M.P.S., on ethylene and propylene glycol which appeared in *The Pharmaceutical Journal* and the *Quarterly Journal of Pharmacy and Pharmacology*. Price 2s. 6d., the booklet gives details of the two products as solvents, preservatives, etc. Among more interesting facts given about them is their degree of efficacy in preserving tannic acid, syrup and gelatin; the inhibitory action of propylene glycol on enzymes and penicillin, and its solvent action on tars; its solvent properties on fresh fruits and herbs and vegetable colouring matter. Both glycols were produced commercially in America some 20 years ago, but failed to attract much attention in this country owing to uncertainty about their toxicity when taken internally. It is now known, however, that propylene glycol is no more toxic than glycerine.

A BOOKLET published by the Manchester and District Advisory Council for Further Education contains details of the courses in specialised branches of chemistry to be provided during the session 1951-52 in the area, and also details of the post-advanced courses in chemistry which form part of the normal provision at Technical Colleges in the area. In the first series are courses on design of experiments, statistical analysis of experimental results, surface and colloid chemistry, chemical hazards of industry, synthetic dyestuffs and biochemical processes with special reference to the use of isotopes in their elucidation.

* * *

THE BCURA Quarterly Gazette devotes itself in its present issue to the 1951 Open Day of the Association, held on 13 June, at Leatherhead, Surrey, where the research station is situated. Many notable personalities were present, including Dr. Harold Hartley and Professor H. W. Melville, F.R.S.—the two 'visitors' appointed by DSIR to make a disinterested scientific appraisal of the work of BCURA—Sir Ben Lockspeiser, F.R.S., and others. The Rt. Hon. Philip Noel-Baker, M.P., Minister of Fuel and Power, was present, and pledged the Government's full support for the work of the BCURA, stressing the great importance of saving coal nowadays.

* * *

THERE is a renewed interest in both grape growing and wine making in this country but very little literature exists which is easily understandable and sufficiently brief for the non-specialist. Amateur vintners and viticulturists, therefore, will welcome an illustrated, 32-page booklet 'Grape Growing and Wine Making' which has been written by S. M. Tritton, M.P.S., F.R.I.C. and which is published by The Grey Owl Research Laboratories, Almondsbury, Glos. The price is 5s. post free.

The booklet contains all the essential information about planting and pruning grape vines and a sufficient description of the principles underlying wine fermentation. A useful table shows the amounts of sugar which must be added to grape juice of varying specific gravities to produce wine of various alcoholic contents. The author discusses a large number of different types of wines including sauterie and sweet wines, fortified wines and wines made from a wide variety of fruits other than grapes,

A PAMPHLET on 'Polaritan' standards for polarographic reagents, has just been issued by Hopkin & Williams, Ltd., the makers of this range of reagents. The purpose of these reagents, say the company, is to provide users of the polarograph with batch-tested materials specially suited for use as supporting electrolytes. The pamphlet gives instructions for testing them and the conditions under which they are tested.

* * *

'ANGEWANDTE CHEMIE,' the fortnightly journal of the Society of German Chemists-GDCh., Verlag Chemie GmbH., Weinheim, shows obviously the great activity of German research work and, by the noteworthy advertisements, the progressive revival of Germany's important chemical industry. The second September number which has just reached us, contains in its 65-pages edition seven original essays, among them: 'On Technology of Magnesium Production', by Dr. W. Moschel, in which the author discusses, quoting the example of the German and American industry, the development and present state of the most practised technical processes for the electrolytic and thermal production of magnesium. The economically most successful electrolytic methods differ with the choice of raw materials, with the preparation of the melting charge for the electrolysis and with constructive formation of the electrolytic cell. The silico-thermal reduction of dolomite finds special interest among the thermal methods. The article contains 25 instructive illustrations. Another contribution on 'Ultra-red Spectrography as an Analytical Expedient', by Dr. W. Lüttke, describes the analytical and theoretical fundamentals of spectroscopic examination both for qualitative and quantitative analysis in organic chemistry; it is richly illustrated with tables and pictures. Moreover the journal brings abstracts from international scientific and trade journals, book and general reviews, reports on congresses and meetings, etc.

* * *

THE Autumn issue of *Smokeless Air*—the journal of the National Smoke Abatement Society, has just been issued. It contains a number of articles on various aspects of smoke-prevention and the pollution of the atmosphere, including *Smokeless Fuels Review No. 4*, and the recent *Alkali, &c., Works Report*.

Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1906 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages or Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

DEB CHEMICAL PROPRIETARIES, LTD., (formerly **DEB SILKWEAR PROTECTION, LTD.**), Belper. (M., 13/10/51). 17 August. £450 further charge, to Mrs. S. E. Ford, Alderwasley, and £300 second mortgage, to V. E. B. Ford, Alderwasley; both charged on 106 Spencer Road, Belper. *Nil. 1 December, 1950.

FIELDEN (ELECTRONICS), LTD., Manchester. (M., 13/10/51). 16 August, mortgage, to Martins Bank, Ltd., securing all moneys due or to become due to the bank; charged on land and buildings thereon at Paston Road, Northenden, with plant, machinery and fixtures. *Nil. 3 May, 1951.

New Registrations

Reine Brothers (England), Ltd.

Private company. (499,701). Capital £100. Engineers, mechanical, electrical, water supply and chemical engineers, etc. First directors to be appointed by subscribers. Solicitors: Holmes Son & Pott, 301 Salisbury House, E.C.2.

Parkersell, Ltd.

Private company. Capital £5,000. Dyers, cleaners, and manufacturing, research, dispensing and analytical chemists. Subscribers: R. J. Parker and D. D. Sellon. Reg. office: 31 Basinghall Street, E.C.2.

Cipla (London), Ltd.

Private company. Capital £100. Chemical and pharmaceutical products. Directors K. A. Hamid, A. F. Dee, A. Gupta, and B. Zutshi. Reg. office: 13 Bloomsbury Square, W.C.1.

City Chemicals, Ltd.

Private company. (499,599). Capital £25,000. Manufacturers of chemicals, gases, drugs, medicines, etc. Subscribers: D. A. Povey, and C. D. Pegrum. Solicitors: Mawby Barrie & Letts, 62/4 Moorgate.

Thanet Moulders Products, Ltd.

Private company. (499,754). Capital £100. Manufacturers of plastic and thermo plastics, phenol, cyanides and cyanogen products, gold extractors, importers and manufacturers of and dealers in chemicals, etc. Directors: H. J. Gordon and A. Craxford. Reg. office: 3 Lloyd Road, Broadstairs, Kent.

British Sulphur Corporation Ltd.

Private company. (499,853). Capital £100. First directors to be appointed by subscribers. Solicitors: Linklaters and Paines, 6 Austin Friars, E.C.2.

Hychem Ltd.

Private company. (499,780). Capital £100. Chemists and druggists, chemical engineers, etc. First directors to be appointed by subscribers. Solicitors: Robert Clayton and Co., 110 New Bond Street, W.1.

Company News

Imperial Chemical Industries, Ltd.

An interim dividend of 3 per cent (actual) on ordinary stock for the year ending 31 December, 1951, has been announced by the directors of Imperial Chemical Industries Ltd. This dividend will be payable on 1 December, 1951, less income tax at the United Kingdom standard rate for 1951/52, to members on the register on 11 October, 1951. For the purpose of payment of this dividend transfers in order must be lodged at the company's Transfer Office, 34 Portland Place, London, W.1, not later than 4 October, 1951.

Ketton Portland Cement Co., Ltd.

Profit of £51,842, after providing for taxation, is shown in the 23rd annual report of the Ketton Portland Cement Co., Ltd., for the year ended 30 June, 1951. A final dividend of 10 per cent (less tax) is recommended on ordinary shares together with a bonus of 2½ per cent (less tax).

R. H. Windsor, Ltd.

Profit of R. H. Windsor, Ltd., for the year ended 31 March, 1951, was £35,309 (£31,555). The year was one of considerable development, and turnover continued to improve. To meet additional orders, a new factory has been built and will be in full production this year. Dividend on £77,000 ordinary stock 7½ per cent (15 per cent of £11,000). Capital issue and new finance expenses £1,870 (nil).

Next Week's Events

MONDAY 15 OCTOBER

Institute of Metals

Sheffield: University, St. George's Square, 7.30 p.m., with Sheffield Society of Engineers and Metallurgists. H. M. Finniston: 'Radioactive Tracers in Metallurgy'.

TUESDAY 16 OCTOBER

Textile Institute

Glasgow: Royal Technical College, 7.30 p.m., with Institution of Rubber Industry and Plastics Institute. A. M. Dobson (Fibreglass, Ltd.): 'Glass Textiles as Reinforcement in the Rubber and Plastics Industries'.

WEDNESDAY 17 OCTOBER

Royal Institute of Chemistry

London: Burlington House, Piccadilly, W.1, 6.30 p.m., with the Food Group, Society of Chemical Industry. Dr. J. R. Vickery (CSIRO, Australia): 'Bacterial Wastage in Eggs, and its Control'.

Society of Chemical Industry

Falkirk: Lea Park Tea Rooms, Callendar Road, 7.30 p.m., Stirlingshire and District Section with RIC. A. J. Field (British Aluminium Co.): 'Some Chemical Aspects of Metals'.

Institute of Fuel

Manchester: Engineers' Club, Albert Square, 2 p.m., with National Smoke Abatement Society. J. C. Cleaves: 'Collection of Dust from Flue Gases'.

The Chemical Society

Belfast: Queen's University, 7-15 p.m., with RIC and SCI. Dr. C. L. Wilson: 'Microgram Analysis; Past, Present and Future'.

Institute of Metals

London: Park Lane Hotel, Piccadilly, W.1, 10 a.m. General discussion on 'Metal Economics'. 4 Grosvenor Gardens, S.W.1. 8 p.m. Conversazione and exhibition.

THURSDAY 18 OCTOBER

The Chemical Society

London: Burlington House, Piccadilly, W.1, 7.30 p.m. Tilden Lecture. Professor C. A. Coulson: 'The Contribution of Wave Mechanics to Chemistry'.

Manchester: University 6.30 p.m., with RIC and SCI. Professor A. R. Ubbelohde: 'Some Problems in the Oxidation of Hydrocarbons'.

Society of Public Analysts

Liverpool: University, 7 p.m. Micro-

chemistry Group, with Liverpool and North-Western Section, RIC. Chemical Microscopy Meeting.

Oil & Colour Chemists' Association

London: Royal Institution, Albemarle Street, W.1, 6.30 p.m. Second in series of postgraduate lectures by H. W. Thompson: 'Molecular Dynamics and Chemical Problems'.

FRIDAY 19 OCTOBER

Society of Chemical Industry

London: Burlington House, Piccadilly, W.1, 6.15 p.m. Corrosion Group. Discussion on 'Corrosion Problems in Industry'.

The Chemical Society

St. Andrews: United College, 5.15 p.m., with St. Andrews University Chemical Society. Professor J. Read: 'William Davidson, *Nobilis Scotus*—A Romance of 17th Century Chemistry'.

Society of Dyers & Colourists

Manchester: Gas Showrooms, Town Hall Extension 6.30 p.m. R. H. Peters and W. J. Marshall (I.C.I., Ltd., Dyestuffs Division): 'The Reduction Properties of Vat Dyes'.

Society of Public Analysts

Billingham: British Titan Products, Ltd., 7 p.m., with Tees-side Local Section RIC: 'Physical Methods of Analysis in the Pigment Industry'.

SATURDAY 20 OCTOBER

Institution of Chemical Engineers

Manchester: Reynolds Hall, College of Technology, 3 p.m. North Western Branch. Sir Harold Hartley (president): 'Chemical Engineering and the Future'.

Birmingham: University, Edmund Street, 3 p.m. Midlands Branch. L. Moller: 'Recovery of Sulphur Dioxide from Effluents Obtained in Sulphuric Acid Manufacture'.

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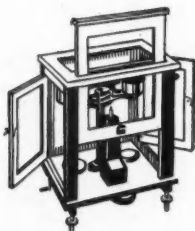
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Further details and application forms from **Civil Service Commission, Scientific Branch, Trinidad House, Old Burlington Street, London, W.1**, quoting No. S.4085/52. Completed application forms must be returned by 15th November, 1951.

Candidates born between 2nd August, 1920, and 1st August, 1925 (inclusive) may be considered but must apply through the Open Competition under Normal Regulations already announced (No. 3399). 13138/120/EH.

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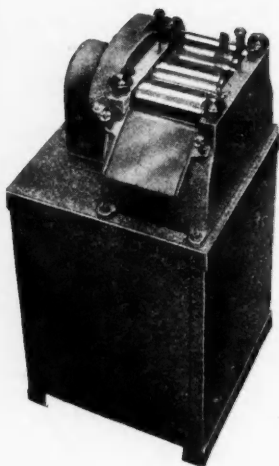
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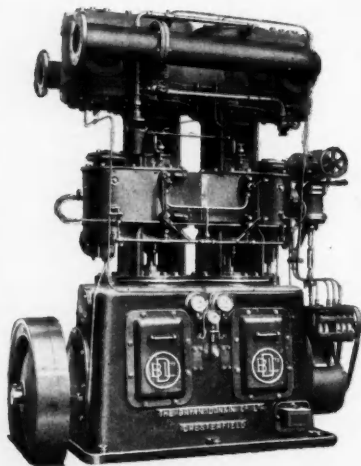
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